

MYTH Of
The Epoch Of Arundhati
Of Nilesh Nilkanth Oak



Dr. Jayasree Saranathan

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Arundhati’
of
Nilesh Nilkanth Oak.

Dr.Jayasree Saranathan, Ph.D (Astrology)

Dedicated To

Vrihannala

MYTH OF
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OF NILESH NILKANTH OAK.

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Contents

INTRODUCTION	10
THE KNOTTY ISSUE OF ARUNDHATI OBSERVATION.....	12
1. No test of elimination of other descriptions of Arundhati.....	14
2. Nimitta (Omen) nature of Arundhati observation.....	14
3. Not testing the traditional Nimitta concepts.....	15
4. Personal bias coming in the way of research.....	16
5. Non-acceptance of astrology amounts to rejection of Vedanga	16
ASTRONOMY SIMULATOR, THE ONLY METHODOLOGY OF RESEARCH	18
CIRCUMPOLARITY OF ARUNDHATI-VASISHTHA	21
Voyager- Simulation Nyaya	22
Analogies as astronomy positions	23
Analogy Nyaya	23
Manipulations and lack of fundamental knowledge	24
PLAN OF THE CRITIQUE	26
CHAPTER 1	28
SYMBOLISM OF ARUNDHATI	28
Arundhati – an icon of third Purushartha.....	28
1. Marriage vow of firmness in the name of Arundhati.....	28
2. The established position of Arundhati as follower of Vasishtha.	29
Meaning of the word Arundhati.....	32
1. Earliest reference to unwavering Arundhati.....	34
2. Arundhati in marriage mantra.	34
Vyasa’s nuanced reference to Arundhati.....	37
Did Kunti wish her sons to tow behind Draupadi?.....	38
History of Arundhati within the history of Mahabharata.....	40
PURVA PAKSHA	42
CHAPTER 2	43
NILESH NILKANTH OAK’S THEORY OF ARUNDHATI EPOCH	43
His assumptions.....	43
His theory	43
Astronomy Basics.	44

Mahabharata astronomy.....	44
Methodology.....	45
Rejects traditional Kaliyuga date.....	48
The Epoch of Arundhati.....	48
On Omens.....	49
Mystery of Arundhati explained.....	50
Causes for Arundhati walking ahead of Vasishtha.....	53
CHAPTER 3	56
EVALUATION OF ASSUMPTIONS OF NILESH OAK	56
Mis-interpretation of the term ‘assumption’	56
1. Accuracy of simulations.....	57
2. Faulty ideas of Nakshatra system of time reckoning.....	58
3. Reliability of the Mahabharata text.....	59
Contradictory theses.....	61
Purpose of astronomy references.....	62
CHAPTER 4	64
FLAWED VIEWS ON MAHABHARATA ASTRONOMY	64
Mahabharata calendar.....	64
Funny concept of “Insertion” of Adhika Masa.....	65
Why Adhika masa is calculated?	66
Oak clueless on year- beginning in Mahabharata times.....	67
Astronomy observations not always visual.....	68
Fundamental concept of Muhurtha not understood.....	69
Oak’s revolutionary discovery of the meaning of ‘Vakri’ motion	69
1. What is Vakri motion?.....	72
Faulty notion about Seasons.....	76
Vyasa had knowledge of newly discovered outer-most planets?	77
CHAPTER 5	82
FAULTY CONCEPT OF EQUINOXES AND SOLSTICES.....	82

Seasons never changed over millennia.	83
Understanding Precession of Equinoxes.	85
The Pendulum movement of the equinox.	86
Evidence of Precession concept of Surya Siddhanta in other texts.....	92
Time factor deduced from Surya Siddhanta concept of equinoxes.	95
Deducing the equinoctial position during Mahabharata.	96
CHAPTER 6	97
METHODOLOGY: FLAWS IN APPLICATION OF POPPER'S FALSIFICATION.....	97
1. Niles Oak's research justifies Kuhn's criticism of Popper's methodology that result is what one wants to see.	99
2. A-V observation is not a Basic Sentence in Popper's criterion.	101
3. A-V observation is a subjective observation and not inter-subjective observation mandated by the theory of falsifiability.....	102
4. Inappropriateness of Popper's falsifiability as a methodology for proving A-V observation.	103
5. Criticism of adhocism leading to manipulation.....	104
6. Falsification does not apply to astrological concepts.....	105
The Mother of Ironies	106
CHAPTER 7	108
METHODOLOGY: FAULTY CONCEPT OF PRAMANA	108
Is A-V observation a valid Shabda Pramāna?	108
Niles Oak Sutra of Pramānas.....	112
A model jingled with jargons.	115
Pramāna is source of Knowledge.	117
Did Arundhati walk ahead of Vasishtha? -Mimamsa explanation.....	119
Did Arundhati walk ahead of Vasishtha? – Pramāna based interpretation.....	120
Vyasa reports deviation in the Pole star too.....	123
CHAPTER 8	128
NILESH OAK'S FAULTY UNDERSTANDING OF PRISHṬHA.....	128
Meaning of "prishṭha" (प्रिष्ठ) in the A-V observation not established.....	128
CHAPTER 9	136
NIMITTA IS NON-FALSIFIABLE	136
Niles Oak's Nimitta concepts.	137

(i) The A-V observation is not a unique nimitta and it is just one among many.	137
(ii) Nimitta is a non-regular, non-ordinary phenomenon, but scientifically explainable.	138
(iii) Nimitta is a sign and must not be confused with ‘Bad omens’	139
Evaluation of Nilesh Oak’s Nimitta concepts.....	140
(i) Nilesh Nilkanth Oak is consistently inconsistent in his explanation for nimitta.	140
(ii) Nilesh Oak has no respect for traditions and the “Indic minds” that stick to tradition.	141
(iii) If omens are testable, why didn’t he test other omens?.....	141
(iv) Why A-V observation was not at all mentioned by others as a nimitta if it was around for more than 6000 years?	142
(v) Can Nilesh Oak show any other omen that ran for 6000 years as A-V did?.....	143
What is a nimitta?	144
Mahabharata, peak time of Nimitta knowledge.....	146
Nimitta is a concept of Astrology.	147
Non-regular appearance of Arundhati to be treated as nimitta – says Mahabharata.	148
CHAPTER 10.....	151
NILESH OAK’S KALI YUGA-DILEMMA	151
The Vyasa factor.....	155
Does Mahabharata give inconsistent views on Yugas?	156
Evidence for Yudhishtira Shaka.	157
Concept of Shaka is old.	160
Janamejaya’s grant refers to Yudhishtira Shaka	161
The Aryabhata-headache of Nilesh Oak.	165
Aryabhata on Yuga, Bharata and Kali Yuga.....	166
Kali Yuga Date derived from Aryabhatiya.....	167
Kali Yuga date deduced from Aryabhata’s age.....	171
Kali Yuga did start on a Thursday.....	172
Evidence of Kali Yuga date in Saptarishi cycle.....	174
Saptarishi Era at Kali year 25.	175
Epigraphic evidence for Kali Yuga date.	177
Evidence from Aihole inscription.....	178

Nilesh Oak's faulty understanding of Siddhanta (Indian Astronomy).....	179
CHAPTER 11.....	182
THE MYTH OF THE 'EPOCH OF ARUNDHATI'	182
The strange scientific discoveries of Nilesh Oak.	184
Did North Pole make peculiar orientation with A-V?	185
Not for 6000 years, but only for 16 hours a day – Arundhati walked in the front!.....	188
Simulator-Nyaya shows Arundhati lagging behind.	194
Right Ascension, not always a proof for movement ahead.	198
Right Ascension not a valid test in non-circumpolarity too.	202
Cassiopeia for comparison.....	202
Setting time decides the final forward position.....	204
Episodes of Arundhati matching with the A-V stars through the millennia.	208
1. Arundhati stayed back when Sapta Rishis went away.	208
2. Arundhati was part of a migration of Sapta Rishis.	210
3. Arundhati insulted her husband and became smoke coloured.....	210
The 'Peculiar Orientation' was due to change in ecliptic obliquity.....	212
Scientific explanation for A-V verse of Vyasa.....	216
Brief note on Atmospheric refraction.	217
Two nimittas on changed refractive index.....	219
Nimittas that suggest asteroid-hit.....	223
Natural calamities:	224
Planetary nimittas in support of asteroid-hit:.....	226
1. Saturn afflicting Prajapati's star-planet.....	227
2. Planet Mars wheeling backwards to Anuradha.	229
3. The star Chitra is afflicted by Gara.....	231
4. The sign on Moon's disc had changed.....	234
5. Rahu moved towards the Sun.....	236
Planetary nimittas seen by Vyasa at the time of asteroid-hit.....	238
1. Shyama graha in Jyeshtha.....	238
2. Vyasa's Pole star nimitta.	239
3. Parusha planet pointing at middle of Citra and Swati.	239
4. Two coppery red- topped planets at the time of rise of Saptarishi Mandala.	240

5. Arundhati had kept her husband at her Prishṭha.....	241
Vyasa's nimittas in support of reversal of atmospheric density.	241
1. At sun-rise flights of insects, by hundreds seen.	241
2. At both twilights, the cardinal quarters seemed ablaze.	242
3. There was shower of blood and ash.....	242
4. Frequent earthquakes and tectonic disturbances.....	242
5. Tsunamis reported.	243
6. The tectonic movement has caused the river to change direction.....	243
7. Release of rare gases from the surface fissures.	243
8. Strange coloured halos around the Sun.....	243
9. Two 13-day phases (Paksha) of the Moon.	244
10. Temporary phenomenon of Arundhati 'walking ahead' of Vasishtha.	245
CHAPTER 12.....	249
DATE OF MAHABHARATA FROM INTERNAL EVIDENCES.....	249
Identifying the calendar of the Mahabharata period.....	249
Deciphering the extra days in exile spent by the Pandavas.....	250
Deducing the beginning of the 5-year Yuga period in Mahabharata.	252
Constructing the Mahabharata calendar from the first year of the Yuga	255
Discrepancy in the start of Uttarayana after the war.....	256
Ratha Saptami, an evidence for the change of Time in Mahabharata.....	259
Can Adhika Masa occur in Magha month?.....	261
Reconstructing the start and the end date of Pandava's exile.	264
Ritu-calculation of the Mahabharata Calendar.....	269
Date of Krishna leaving Upaplavya on peace mission.	271
Which month is Kaumudi?	271
The date of Peace Mission	274
Proof against Varsha season proposed by Nilesh Oak for Krishna's peace mission.	276
Asteroid or comet impact during Krishna's peace mission.	277
At the time of Krishna leaving Upaplavya.....	277
At the time of appointment of Bhishma as the Chief Commander.....	279
The attack of a comet on Pushya day	280
At the time of Krishna leaving Hastinapur	281
Scientific evidence for a comet hit in 3136 BCE.....	282
Vyasa refers to loss of Tithi twice but not twin eclipses.....	286
Bodhayana Amawasya tarpan done by Krishna.....	291

The second Trayodasi Purnami repeated in Vyasa's version.	291
Sequence of Mahabharata events after the exile.....	296
1. Lunar Ashadha month: (Sun in Cancer)	296
2. Lunar Shravana month: (Sun in Leo)	297
3. Lunar Bhadrapada month: (Sun in Virgo).....	297
4. Lunar Ashvayuja month: (Sun in Libra)	297
5. Lunar Kartika month: (Sun in Scorpio)	297
6. Lunar Margashirsha month: (Sun in Scorpio / Sagittarius).....	300
A brief on Balarama's pilgrimage.....	301
6a. Lunar Margashira month Continued:	306
7. Lunar Pushya Month (Sun in Sagittarius).....	310
Deciphering the day of Gitopadesa	310
The starting date of the Mahabharata war.....	312
Corroboration of the astronomy features for the first day of the war.	313
Twin eclipses during the war.....	320
The lunar eclipse on the third day of the war.	320
The solar eclipse on the 19 th day of the war.....	325
Did Bhishma fail to judge the arrival of Uttarayana?	330
Nilesh Oak's views on Bhishma Nirvana.	332
Three verses on Bhishma's waiting period.	332
1. Krishna assigned "remaining 56 days" for Bhishma.	333
2. Yudhishtira found very 'few days remaining' for Bhishma.	335
3. Bhishma declared that he waited for '58 nights'	336
Month- Tithi-Nakshatra alignment for 58 days.....	337
1. Points of synchronisation:.....	338
2. Points of non-synchronisation.	339
The late moon-rise on the night of the 14th day of the war.....	341
1. The rationale of Krishna's 56 days:	342
2. Bhishma's 58 days:	342
The coronation of Yudhishtira.	343
Sequencing the days since Bhishma started imparting knowledge to the Pandavas.	345

Day 1 of the conversation with Bhishma (Magha Shukla Tritiya)	345
2. Day 2 of the conversation with Bhishma (Magha Shukla Caturthi)	347
3. Day 3 of the conversation with Bhishma (Magha Shukla Pancami).....	351
4. Day 4 of the conversation with Bhishma (Magha Shukla Shashthi).....	351
Did Bhishma live for 50 more nights after the conversation?	352
Sequencing the dates of Bhishma Nirvana	354
Calculation of the 58 nights of Bhishma:	357
Calculation of the 56 days of Krishna:.....	357
Mahabharata Time-line.....	357
Defects in Nilesh Oak's Bhishma Nirvana research.	359
Of Sequence (Anukrama) and scientific acumen of Nilesh Oak.	360
Chapter 13	362
THE 'FALL' OF ABHIJIT AND THE RISE OF VEDIC CULTURE	362
Nilesh Oak's explanation in his book.	362
Problems with Nilesh Oak's theory of Fall of Abhijit.	364
Contextual analysis of the Fall of Abhijit.....	367
Birth of Vishakha.....	368
Abhijit, wives of six rishis and marriage of Svaha with Agni.....	369
Catastrophe from the sky.	370
Decoding Markandeya's narration.	371
Marriage of Svaha with Agni conducted by Skanda signals the start of Vedic Homa.	371
Vedic Homa: Initiated by Skanda and carried over by Vivasvan and Manu.....	374
Date of Skanda from Tamil literature.....	376
Skanda's location at Tiruchendur.....	380
Fall of Abhijit noticed from Tiruchendur.	380
Early evidence of rice in Tiruchendur supports genesis of Vedic Homa around that region.	382
Abhijit was the younger sister of Rohini.....	384

Dhanishtha and Rohini were foremost	385
THE “FALL” OF ABHIJIT DECIPHERED.....	390
Abhijit Muhurtha.....	393
Ramayana references about Abhijit.....	393
10,800 BCE witnessed a comet-hit.....	396
1. Krittika in, Rohini away, Abhijit out and Vishakha split!.....	398
2. Krittika seemed to have fulfilled some important requirements.....	399
3. Krittika offered new identity for the spouses of six of the sapta rishis.	400
4. Krittika ruled high in the Heavens when Abhijit ‘fell’ behind the forests.	401
5. Krittika’s inclusion to match with the shower of fire from comet-hit.....	402
10,800 BCE Comet-hit impacted India too.	403
APPENDIX I.....	405
List of Manipulations done by Nilesh Oak to ‘corroborate’ his date of Mahabharata.	405
(1) Experiment No 10: “Jupiter and Saturn near Visakha”. (Mahabharata reference No 6 in his book)	406
(2) Experiment number 11: “Saturn near Bhaga” (Mahabharata reference No 10 in his book).	407
(3) Experiment number 12: “Mercury travelling through all nakshatras”. (Mahabharata reference No 15 in his book)	409
(4) Experiment numbered 13: Vakri’ motion of Mars. (Mahabharata reference No: 11, 13, 14 in his book)	410
(5) Experiment No 14: “Jupiter going vakri near Shravana” (Mahabharata reference no 11 in his book)	411
(6) Experiment No 15: “Venus near Purva Bhadrapada. (Mahabharata reference No 18 in his book) ...	413
(7) Experiment No 16: “Tivra or Tikshna, Planet or nakshatra near Krittika” (Mahabharata reference No 21 in his book)	415
(8) Experiment number 17: “The Sun and the Moon together afflicting Rohini” (Mahabharata reference no 26 and also 8, 9, 12 in his book)	416
(9) Experiment No 18: “Jupiter, similar to the Sun and the Moon, afflicting Rohini after the sunset on the 17 th day of War”. (Mahabharata reference No 12 in his book)	417
(10) Experiment No 19: “Saturn afflicts Rohini”. (Mahabharata reference No 8, 9 in his book)	418

(11) Experiment No 20: “Unusual (Tiryak) rising of Mercury on the 17 th day of the War (after the sunset) (Mahabharata reference No 16 in his book)	418
(12) Experiment No 21: “Mars, Venus & Mercury in the western sky after sunset, 18 th day of the war” (Mahabharata reference No 17 in his book)	419
(13) Experiment No 22: “Seven planets seen near the Sun” (Mahabharata reference No 24 in his book).....	419
(14) Experiment No 23: “Seven planets attacking the moon” (Mahabharata reference No 23 in his book.	420
(15) Experiment No 24: “Seven planets going away from the Sun.” (Mahabharata reference No 25 in his book)	420
(16) Experiment No 25: “Brightly shining comets (!) in the sky”	420
(17) Experiment No 26: “Shweta (near Chitra) & Shyama (near Jyeshtha)” (Mahabharata reference No 19, 20).....	420
(18) Experiment No 27: “Comet attacking Pushya” (Mahabharata references No 21, 22).....	421
APPENDIX II.....	428
Mathematical calculation of relative rise and set time of stars with particular reference to Alcor (Arundhati) and Mizar (Vasishtha) in the period of Niles Oak’s ‘Epoch of Arundhati’	428
Harish Saranathan, Ph.D	428
(Aerospace, Aeronautical and Astronautical Engineering)	428

Introduction

I never knew that dating an historical event can be so easy until I read the book “WHEN DID THE MAHABHARATA WAR HAPPEN? THE MYSTERY OF ARUNDHATI” written by *Niles* *Nilkanth Oak*. All that you need to do is to get fascinated by an astronomy observation that you read for the first time in the University library and think you have comprehended it, check the works of others and pick out the one that sounds more like yours, buy astronomy books and star catalogues to acquaint yourself with the terms and basic concepts and run the simulator at regular intervals to see what you thought appears in the screen no matter what it

could mean in astronomy. If you catch up a scenario that you are looking for on a select window of the simulator that is eureka moment for you and with that you can claim yourself a revolutionary like **Copernicus, Kepler and Galileo!**

The kind of impression as above that one gets on reading this book is quite disturbing for the reason that the research constructed in this way and trumpeted as one based on **scientific acumen** and **logical reasoning** by the author himself is in effect questioning the very basics of TWO ISSUES OF IMPORTANCE to the Hindu society. His entire research is aimed at proving that the *iconic characterisation of Arundhati is indeed wrong*. She as one following the steps of her husband **Vasishtha** still continues to be invoked in Vedic mantras in the Hindu marriages, and his research renders this practice ridiculous. His theory, if accepted would amount to *dismantling the iconic status of Arundhati in the Hindu society*.

The other issue pertains to the date of Mahabharata war deduced by Oak in his book which is a contravention to the current system of time keeping. Everyday millions of times in this country, the current time is being invoked in the **Sankalpa mantras** from the BEGINNING OF KALI YUGA that started 5120 years ago at the time of writing this. His book has created a piquant situation that *if his date is right it means the present age of Kali Yuga is wrong* and with that, the alignment of week day and the solar year would also be wrong for the very reason that these two are intertwined and the week day used all over the world today is calculated from the first day of the Kali Yuga that started 5120 years ago.

By discrediting a cultural symbol of our society and destabilising the foundation of time keeping, NILESH OAK'S RESEARCH THROWS A DISTURBING AND A SERIOUS CHALLENGE TO THE VERY BASIS OF THE HINDU SOCIETY which is still functioning on the formulations given by the Vedic sages of yore. His research throws a challenge to the ingenuity of the Vedic sages for elevating Arundhati perennially to the celestial sphere much like Dhruva, the son of Uttanapada.

Nilesh Nilkanth Oak's research is **based on a single verse** of sage Vyasa told to Dhritarashtra just before the commencement of the Mahabharata war expressing a deviation in the usual appearance of the binary, Vasishtha and Arundhati (Mizar and Alcor) in the Ursa Major constellation identified as *Saptarishi* constellation by the Vedic society. The binary is always seen as though the star Arundhati is towing behind the star Vasishtha much like the real character Arundhati who always followed her husband Vasishtha. At the time of

Mahabharata war, sage Vyasa has made a statement that Arundhati kept Vasishtha at her back – ‘PRSTHATAH KRTAH’.

This expression has been taken by Nilesh Oak as scientifically testable one, or to use his word from Karl Popper’s terminology, ‘falsifiable’ one. He has checked the position of these two stars in a select window of the latest version of Voyager software and made the claim that Arundhati walked ahead of Vasishtha for more than 6000 years and has named that period as the “EPOCH OF ARUNDHATI.” Since the observation of Arundhati walking in front of Vasishtha was reported by Vyasa, Oak hypothesises that Mahabharata could have happened only within the Epoch of Arundhati. And in the absence of such an observation, Ramayana must have happened before the Epoch of Arundhati, according to him. Picking out the other astronomy references in Mahabharata and fitting them within this Epoch using his Voyager simulator, he has identified *the year 5561 BCE as the year of Mahabharata war*. This is clearly **far earlier than the traditional date of Mahabharata by more than 2000 years!**

It is not an understatement that an average Hindu who believes in the symbolism of Arundhati and the Hindu time scale is anguished by these ideas promoted as having passed scientific and empirical tests. Therefore the need arises to put into test his ideas and the methods he has used to push these ideas. Basically this can be re-phrased into two questions:

- (1) DID ARUNDHATI ‘WALK AHEAD’ OF VASISHTHA?
- (2) DID NILESH OAK USE A RELIABLE METHODOLOGY OF RESEARCH?

The knotty issue of Arundhati observation.

There is absolutely no indication anywhere in his book, or in his blogs and videos released until the time of writing this, that Nilesh Oak ever thought about the conflict with the symbolism of Arundhati that his research is creating. There can be no denial of the fact that he **began his research on Arundhati with no idea of who she was** and what she stood for and why a star was named after her. He was attracted to Arundhati observation for a ‘*simple reason*’ - to quote his words, “*I could understand it and I felt it, naively so, that I could easily test it.*”¹ Let him test it, but test he must after logically deriving the concept or conceptually explaining the idea or mathematically working on the idea wherever required. Only after getting a concept or the numbers derived in different methods should one test it in the

¹“When did The Mahabharata War Happen?” Page 57

simulator. THE SIMULATOR OR SOFTWARE SHOULD ENDORSE THE FINDINGS BUT NOT BE USED AS THE SOLE MEANS OF GIVING AN OUTPUT WHICH ONE WANTS TO SEE.

His book reveals that his research into dating the Mahabharata war was not methodical but one that was based on checking different simulators until he got what he wanted to see.² Once after he got it from the simulator, everything else was ‘**corroborated**’ including the methodology that he is vociferously boasting out in his videos and blogs **but scarcely mentioned in his book.**

Passion for an issue can never be questioned as an inspiration for a research but it was a different take as far as Nilesh Oak is concerned. *Anyone wishing to solve an issue would learn the subject first, but Nilesh Oak preferred to gain the knowledge of the subject after solving the issue, in other words after falsifying the Arundhati observation ‘scientifically’ by means of the simulator.* Writing on this Nilesh Oak says,

“If I could solve this problem, I reasoned, I would be willing to put extra efforts to understand nakshatras and positions of planets, in order to comprehend remaining Mahabharata observations. On the other hand, if I could convincingly prove that Arundhati observation was not a mystery at all, but rather an absurd statement introduced by either the original and later authors, I would be saved from the torture of understanding and/or interpreting remaining Mahabharata observation.”³

No one can be expected to have prior knowledge of the factors involved in the research as research is a ‘*systemized effort to gain new knowledge*’⁴ but no research can be called scientific unless it involves collection and classification of data and determination of the reliability of the data before building up the hypothesis.⁵ Arundhati is a history within history (of Mahabharata) calling for a thorough analysis of whether or not the Arundhati observation by Vyasa merits the importance that Nilesh Oak thinks it has. *With no knowledge of Arundhati given in different contexts and no knowledge of astronomy, Nilesh Oak had embarked on this research.*

The main problem with his research comes from this fact that he has cared less to know anything other than the Arundhati observation and not done a scientific study of the available data on Arundhati.

²Ibid. Pages 62 - 67

³Ibid. page 57-58

⁴L.V.Redman and A.V.H.Mory, “The Romance of Research:”, 1923, page 10

⁵ Sreedhran, “A Manual of Historical Research Methodology”, 2007, pages 23-24

“The collection and classification of data, the determination of the authenticity and reliability of the collected data, the building up of hypotheses and generalizations – in all these the spirit that moves the historian’s work is entirely scientific.”

1. No test of elimination of other descriptions of Arundhati

Nilesh Oak had come to know about the Arundhati-Vasishtha observation much later, when he was in the **University of Alberta**. From then on there was no looking back, sans any grounding on the significance of Arundhati in different contexts in the Epics. *Taking up a single reference is fine, provided he has eliminated all the other references by establishing that they don't run counter to the single reference he has taken.*

There are specific references to Arundhati as a star when she was smoky, feeble and stayed back when all the seven rishis had gone away from her. What do they all convey, especially the reference that the seven rishis had left her? Should it be taken as factual that Arundhati star was left behind by Vasishtha and other stars of the seven-star group or just an allegorical reference to an incident in Arundhati's life? Suppose it refers to a change in the position of Arundhati star how does it compare with the present issue of Arundhati 'walking ahead' which could refer to Arundhati taking over Vasishtha? *Many references are found in Mahabharata in different contexts which must have been analysed to prove that this particular reference of Arundhati 'walking ahead' of Vasishtha is not countered by any of them.*

Ramayana also gives a reference of Arundhati being angry⁶ which goes against Nilesh Oak's theory that Ramayana occurred at a time before Arundhati 'walked ahead' of her husband. What was conveyed by being angry? Did her movement in the front an indication of her anger? Without solving this Nilesh Oak's surmise that Ramayana occurred before the 'Epoch of Arundhati' sounds erroneous. Interestingly none of the references in the two epics on Arundhati, the star were taken at face value by the Vedic society or else HOW COULD HER NAME BE INVOKED IN THE VEDIC MARRIAGE MANTRAS FOR BEING FIXATED IN HER POSITION? With such a serious difference in the way Arundhati has been perceived, a good historiographer is expected to have done an objective analysis of all the references to establish his reference as inviolable. Nilesh Oak made no attempt to check the other references but was only **guided by the fascination** he had for the specific reference on Arundhati star.

2. Nimitta (Omen) nature of Arundhati observation

Granted that he is fascinated by this specific description, shouldn't Nilesh Oak work on the context to know what exactly had been told by Vyasa?

Vyasa's description falls under the category of **Nimitta** (omens), something Vyasa himself expressed before making the observation on Arundhati star.

⁶Valmiki Ramayana: 5-33-8

The fact is that the nimitta nature of the observation is mentioned nowhere in the book. However Nilesh Oak talks elaborately to the extent of giving HIS OWN THEORY OF OMENS in his blogs written much later – *perhaps after getting confronted on this issue by his critics*. He has made his own theories and even counter theories but **none of them were gleaned from the available olden sources**. This is not the way a historiographer works whose aim, to quote Carl Becker of Cornell University, must be

“to know what ideas, true or false, were at any time accepted and what pressure they exerted upon those who entertained them.”⁷

He has to dig out the ideas prevailing at the time and space world of the person who made this Arundhati-Vasishtha observation.

Any theory of Nimitta in the historical methodology must be the one IN VOGUE IN THE ANCIENT SOCIETY UNDER RESEARCH AND NOT THE PERSONAL VIEW OF THE HISTORIOGRAPHER. Perhaps Nilesh Oak thinks that this methodology of the historiographer does not apply to him as I understand that he prefers to identify himself as an **archaeo-astronomer** nowadays.⁸ But then an archaeo-astronomer cannot afford to ignore the cultural and social views of the period under research of the kind that Nilesh Oak has done, which is better recognised as BROWN ARCHAEO-ASTRONOMY.⁹

3. Not testing the traditional Nimitta concepts

It is not difficult to deduce the nimitta concept of Mahabharata times. The nimittas enumerated by Varahamihira in Brihat Samhita¹⁰ were attributed to sage Garga and sage Atri. Garga was contemporaneous to Mahabharata times while Atri belonged to Ramayana times. Therefore it is perfectly justifiable to apply the nimitta definitions of Brihat Samhita to Vyasa's verse on a nimitta pertaining to the astronomy observation on Arundhati. This must have been Nilesh Oak's first experiment on error elimination, but **the ironical fact** is that *his book would not have emerged at all if he had checked this feature!*

Starting from this basic feature to all the other concepts, all explanations in the book are EITHER MODERN IDEAS OR NILESH OAK'S OWN IDEAS. They are not in consonance with the concepts of the ancient Vedic society. This is known as the PROBLEM OF 'present-mindedness' IN HISTORICAL RESEARCH. It is not enough the researcher possesses the reading ability of the

⁷ Carl Becker, “What is Historiography?”, The American Historical Review, Vol 44, No 1 (Oct 1938) pp, 20-28

⁸ <https://www.youtube.com/watch?v=iMV3FEiCjCI>

⁹ https://en.wikipedia.org/wiki/Archaeoastronomy#Brown_archaeoastronomy

¹⁰ ‘The Brihat Samhita’, Chapter 46, p 195. Translation by N.C.Iyer.

verse and its translation; he must learn and acquaint himself with the terms peculiar to the astronomy observations of the Vedic society of Mahabharata. It is like how a non-medical person cannot write a thesis on a medical issue using the medical terminologies interpreted by his own imagination and understanding. Every field has its own and specific terminologies and concepts. Nilesh Oak has ignored this basic requirement in building his theory. Most of the experiments enumerated by him in his book suffer from this defect.

4. Personal bias coming in the way of research

Nimitta, also known as **Shakuna** is part of astrology. But *you mention the word astrology, Nilesh Oak gets allergic.* He expresses this in the very beginning of his book in the Introduction that,

“The problem with this approach is that once one starts using astrological interpretations, there is no stopping and thus anything anywhere can be explained.”

He re-asserts the same view later in the book,¹¹

“The problem with ‘Astrological Drishti’ is that once one decides to employ it, anything anywhere can be explained! As soon as this happens, although theory may still retain its empirical character, it is no longer falsifiable and scientific.”

Only Nilesh Nilkanth Oak does the explanation of any kind at his will compromising on empirical and scientific nature, which I will be showing at appropriate contexts. He refuses to accept the fact that Vyasa has used only astrology terms. For example words such as ‘**vakri**’ (retrogression) and ‘**pidana**’ (seizing, affliction) and references like **Shyamo** graha, **Sweta** Graha, **Krittikasu** graha and such other ones are GIVEN NEWER MEANINGS AND DEFINITIONS BY NILESH OAK WHILE ALL THESE ARE PRESENT IN THE LEXICON OF ASTROLOGY. By vehemently resisting the use of astrological meanings for the astrological terms found in Mahabharata, Nilesh Oak has *compromised on the veracity of his research.* A sincere researcher would look into the meaning of the words as *used by the society under scrutiny* and not allow his personal bias to interfere.

5. Non-acceptance of astrology amounts to rejection of Vedanga

By refusing to accept astrological explanation for the astrological terms in Mahabharata Nilesh Oak has also demonstrated HIS CONTEMPT FOR THE VEDIC LORE. Astrology is a

¹¹“When Did The Mahabharata War Happen”, page 185.

Vedanga and is regarded as the eye of the Veda Purusha. **Lagadha** in his **Rig Vedanga Jyothisha** regards Jyothisha (astrology) as the chief of all Vedangas. He says,¹²

“yathā shikhā mayurānām nāgānām maṇayo yathā
Tadvad vedāṅga shastrāṇam jyotisham murdhani shitam”

(Like the combs of the peacocks and the crest-jewels of the serpents, so does the lore of Jyothisha stand at the head of all the lore forming the auxiliaries of the Vedas)

It is ‘**KĀLA VIDHĀNA SHASTRAM**’¹³ – a treatise to know the nature of Time, says **Yajur Jyothisha**. It is only to tell the nature of time at the beginning of the war, Vyasa has given the Jyothisha features as nimitta, witnessed at all levels - terrestrial, atmospheric and celestial. Of these three, the celestial features are also analysed under a category called **Gaṇita**.¹⁴ Gaṇita is a part of Jyothisha and *equivalent to astronomy*. Actually Gaṇita means calculation, and in Jyothisha it deals with fundamentals pertaining to celestial bodies and calculation of their movement. Varahamihira calls this as **Tantra sastra**¹⁵. Only **Jyothisha Siddhantas** come under Gaṇita.

Nilesh Oak must take note of the fact that the **ARUNDHATI- VASISHTHA OBSERVATION (A-V OBSERVATION) WAS NOT GIVEN AS PART OF GANITA BUT ONLY AS A NIMITTA BY VYASA**. *If it is Gaṇita then calculation (or scope to calculate) would be involved* or a generic statement would be made.

A statement such as ‘*Vasishtha was behind Arundhati*’ is generic and could refer to the position found at all times, or even for a period as long as 6000 years. Such a statement would *find place in the Siddhantic literature* of some Vedic sage in the past along with the duration of the period when the pair changed places. But what we see in Mahabharata is a statement that ‘*Arundhati put Vasishtha at her back*.’ This is **NOT A GENERIC STATEMENT BUT A SUBJECTIVE STATEMENT**. Such statements qualify as nimitta where no calculation is involved as in Gaṇita due to its transient nature.

Another difference between Gaṇita and nimitta is that **Gaṇita** pertaining to a *celestial body can be calculated even without physical observation* but a **NIMITTA IS ‘SEEN’ OR HEARD OR FELT SUBJECTIVELY** and treated as a *cause associated with a result expected sometime later*.

Association with a result or predicting a result from a celestial feature or celestial combination is completely absent in Gaṇita shastra. Nimitta on the other hand is a predictive

¹²Rig Vedanga Jyothisha: verse 35

¹³Yajur Vedanga Jyothisha: verse 3.

¹⁴Prasna Marga, Chapter 1: 5-7

¹⁵Brihat Samhita, Chapter 1:9

tool for nations and people. It does give prediction on any planetary combination or a sighting (such as A-V observation) or an atmospheric or a terrestrial event at a given moment. It is more like **Prasna** or **horary astrology** that applies to individuals.

Both **Gaṇita** and **nimitta** are parts of *six angas of Jyothisha* – the other four being **Jātaka**, **Gola**, **Prasna** and **Muhurta**.¹⁶ All these six can be synchronised into just three as *Gaṇita*, *Hora* (horoscopy) and *Samhita* of which *Samhita* deals with *Nimitta* elaborately. One can check with Brihat Samhita to see that a huge part of that book deals with *Nimitta* of sorts. As a researcher Nilesh Oak should have written his book using inputs from the source material (Jyothisha) and tested with modern scientific methods.

The faulty interpretation of the astrological terms and references in his book *could escape the scrutiny of an average reader not familiar with the field of astrology*. But anyone in the know of the FUNDAMENTALS OF ASTROLOGY OR ASTRONOMY would find it difficult to approve his research and the contents of his book.

Here I mention astronomy along with astrology for the reason that both deals with the same terms and references of the celestial bodies. **The only difference between astronomy and astrology** is that the latter associates a result or an outcome with a celestial reference or phenomenon while that is absent in the former. WITH ABSOLUTELY NO EXPOSURE TO OR EXPERTISE IN EITHER OF THE TWO, NILESH OAK HAS VENTURED TO ‘FALSIFY’ AND ‘CORROBORATE’ ASTRONOMY REFERENCES IN THE SIMULATOR WITH NO KNOWLEDGE ABOUT THE BOUNDARY CONDITIONS TO BE APPLIED.

Astronomy simulator, the only methodology of research

The very first assumption¹⁷ of Nilesh Oak in his book is about the *accuracy of the astronomy software* he has used. Of the 11 assumptions, 9 are on the authenticity of Mahabharata text and one on Nakshatra system of time during Mahabharata period. This leaves the software as the only source of methodology of testing his concepts and hypothesis on Arundhati ‘walking ahead’.

No one doubts the accuracy of the software, but the question is: *did Nilesh Oak enter the accurate data in the software?* THE OUTPUT OF THE SOFTWARE DEPENDS ON THE INPUT GIVEN BY THE USER. Nilesh Oak picked up **Dr P.V.Vartak’s** version¹⁸ of Amawasya as the first day of

¹⁶Prasna Marga : 1-6

¹⁷“When Did The Mahabharata War Happen?” Page 13 - 14

¹⁸Ibid. Page 78

the war and checked it in the simulator. The problem with this date is that *it clashes with the Mahabharata version on the location of the moon on the 14th day of the war*. If the war had started on Amawasya as Nilesh Oak claims, it means the moon was growing for the next two weeks before culminating into Full Moon. Since the war went on for 18 days, the Full Moon must have occurred around the 16th day of the war.

But MAHABHARATA REPORTS MOON-RISE ON THE 14TH DAY OF THE WAR IN THE LAST QUARTER OF THE NIGHT, THAT IS, APPROXIMATELY 3 HOURS BEFORE SUNRISE! It means moon was at around 45° in the eastern sky at the time of sunrise. At this distance from the sun in the east, the tithi must be around **Krishna Ekadasi** or **Krishna Dwadasi**.

This is clear indication of waning phase that started a few days after the war began. In other words Full Moon had occurred a few days after the war had started and the war did not begin on Amawasya as Nilesh Oak claims. The successive nights after the Full moon would see successive late risings of the moon. This was reflected in the absence of moon-description in the first 8 days of the war.

But what does Nilesh Oak say? HE CONCEDES THAT THE 14TH DAY LATE MOON-RISE IS IMPOSSIBLE FOR HIS TIMELINE¹⁹

And it contradicts “practically all observations discussed in the context of ‘late moonrise’ of the 14th day as well as all Mahabharata observations discussed”²⁰ by him in the earlier chapters. With all that he went ahead with Amawasya mainly because that date came closer to the planetary alignments that he could corroborate from the simulator!

In the process he chose to ignore the more crucial factor, namely the location of the moon. Corroboration comes later and can be done ‘scientifically’ through software, but the more important part of a scientific research is classification of data – of ascertaining the boundary condition upon which all the other data can be corroborated.

According to him *the absence of moon-description “for the first 8 days of War and abundance of ‘full moon’ descriptions for the last 7 days of the War”* when combined with the corroborations he made of planetary combinations, shows the late moon-rise on the 14th day of the War *“as being close to the full moon day.”*²¹ What he refers to as abundance of full moon descriptions in the last 7 days of the war are ANALOGIES!

¹⁹Ibid. Page 126

²⁰Ibid. Page 131

²¹Ibid. Page 130

Taking analogies as true astronomy features and treating the absence of moon -description in the first 8 days as corroboration for waxing phase indicates only one revelation - that the ACCURACY OF THE SOFTWARE IS NOT AN ISSUE, BUT THE INPUT FED BY THE RESEARCHER IS.

If interpreting the text correctly to extract the true astronomy references is one side of the research, the other side calls for SUBJECT KNOWLEDGE OF ASTRONOMY, in the deficiency of which he must have got his hypothesis of Arundhati walking in front of Vasishta that he picked out from the simulation, approved by an astronomer or an astro-dynamicist. He does mention in the last pages of his book that he did show the draft of his book to a friend conversant in astronomy, (not an astronomer) and the response given by him is in no way near to what a specialist in astronomy would say.²²

He did have access to a Professor of Physics and his team working in astronomy at the University of Calgary whom he approached for getting to know the basic astronomy terms. Nilesh Oak writes,²³

"I do not know if they understood what I was after but they were helpful. They explained what proper motion meant, taught me about 'Declination' and 'Right Ascension' coordinates and allowed me access to their small library."

So THEY DIDN'T UNDERSTAND WHAT HE WAS LOOKING FOR.

Can it be interpreted that he didn't explain them what exactly he was looking for?

Did he ask them the right questions to get factual answers, because only rightly worded questions can get the right answers?

The answer depends on what one has asked. If he was genuinely after an answer he could have definitely made them understand what he was looking for and got an answer from them as they were experts in the field. If not at that time, he could have asked an expert in the field to authenticate his finding after he finished his research. That could have made his work unquestionable.

But what impression one gets on reading his book?

Like a blind man groping in the dark he is found checking out whatever he can lay his hands on.

He tried with **proper motion**, **declination** and then with **right ascension** without a clear understanding of what one must look for, to know whether a star is ahead of another.

²² Ibid. Page 211-212

²³ Ibid. page 59- 60

In the textual context he did not establish whether the verse actually meant ‘moving forward’. In astronomy context too he did not and could not establish what is meant by moving forward and whether smaller right ascension is the only way to determine that a star moves ahead of the other.

Circumpolarity of Arundhati-Vasishtha

Common sense dictates that the binary stars in circumpolar motion appear differently as if to change their position within a single day owing to the fact they move in a circular path. *In Nilesch Oak’s year of Mahabharata war this pair was in circumpolar motion.* For an observer in Hastinapur²⁴, the binary could be seen circling the central pole star within 30 degree radius with a constant change in the position, that it is not possible for an observer to say if one of the stars in the binary is in front or back or above or below with reference to the other. For a visual observer the position would look different each time he looks up at them.

Even in the simulation for the entire span of more than 6000 years, when he says Arundhati was moving ahead of Vasishtha, he can show²⁵ *a difference of 6 seconds to 30 seconds only* in the movement between the two stars. HUMAN EYE CANNOT MAKE OUT ANY DIFFERENCE BETWEEN TWO STARS THAT CROSS THE MERIDIAN WITHIN 30 SECONDS.

While he wants us to believe that Vyasa did visually observe the star Arundhati walking ahead, with Vasishtha following suit in less than 30 seconds, he makes a statement elsewhere that there will be an error of +/- 1 day in visually determining the star of a day transited by the Moon!²⁶

This statement could either mean that Oak *does not know what a star means in the traditional system*²⁷ or he makes *a safe statement* so that he can correct and ‘corroborate’ the textual evidence of a star- location with what he sees in the simulation.

Page after page as one comes across this kind of stuff promoted as scientific and empirical, a reader having exposure to astrology and visual astronomy for nearly four decades and conducting star gazing sessions for students, can either ignore the entire stuff or write a critique for each and every flaw found in this book. I decided to go for the second option mainly for the reason that THE YOUNG RESURGENT YOUTH OF INDIA SHOULD NOT BE MISLED

²⁴Sage Vyasa made the A-V observation at Hastinapur, the capital city of Kauravas.

²⁵<https://www.youtube.com/watch?v=mjp562gskx0&feature=youtu.be>

²⁶“When did the Mahabharata War happen” page 35-36

²⁷A star is a span of 13.2 degrees in the traditional system of astrology. It is named after one of the stars present within that span.

BY HIS BOOK AND CLING ON TO IDEAS THAT ARE AGAINST THE VEDIC TRADITION. I could see *the youth of today getting excited over the thought of a long past for Vedic India and modern software being put into use to establish the past.* But THEY SHOULD NOT BE FED WITH FAULTY UNDERSTANDING OF THE TEXTS AND CONCEPTS AND MINDLESS USE OF SIMULATION FOR ESTABLISHING EVEN THE MEANING OF SCRIPTURAL CONCEPTS.

Voyager- Simulation Nyaya

From the way Nilesch Oak defines and deduces Mahabharata vocabulary and references through Voyager simulations, I am tempted to name his interpretations as ‘VOYAGER-SIMULATION NYAYA’!

This Nyaya does not require one to know the meaning of the words in which Vyasa and sages had composed their verses. It is just enough to run the simulation until you get the configuration you comprehended from the verse. This is what Nilesch Nilkanth Oak has done throughout the book. He even encourages his readers to do the same – to run the simulation to validate his findings.²⁸

There is no validation conceptually or mathematically for any celestial position he picked out from Mahabharata or in the simulation. Even a 4th standard child can do the simulation he has done, and the couple of calculations²⁹ he has given in the book is 4th standard arithmetic³⁰ only. And THE CORROBORATIONS HE CLAIMS IN THE BOOK SOUND LIKE CHILD’S PLAY.

For instance he interprets a verse³¹ from Mahabharata to mean *that there are seven planets ‘near’ the sun*, though there is nothing explicit in the verse to suggest that seven planets were “near” the sun. However Nilesch Oak ‘*corroborated’ his interpretation by showing seven planets from east to west*³² - and the SEVEN IS INCLUSIVE OF THE RECENTLY DISCOVERED NEPTUNE AND URANUS! But were the planets near the sun? It doesn’t matter. “*Voyager does confirm presence of seven planets from east to west*”³³ Nilesch Oak has proved ‘scientifically’ that seven planets were in the sky. This is what Vyasa must have meant. Oak will count it as a successful corroboration of an astronomy reference in Mahabharata.

²⁸“When Did The Mahabharata War Happen?” Page 69

²⁹Ibid. Pages 60 & 61

³⁰Arithmetic with decimal numbers is introduced in 4th standard in the CBSE stream.

³¹maghā viṣayagaḥ somas tad dinam pratyapadyata
dīpyamānās ca sampetur divi sapta mahāgrahāḥ Reference 24 in his book.

³²“When Did The Mahabharata War Happen?” Page 87.

³³Ibid.

Analogies as astronomy positions

THE VOYAGER- SIMULATION NYAYA IS CAPABLE OF PROVING EVEN ANALOGOUS STATEMENTS. A verse in Mahabharata compares seven Kaurava brothers attacking Bhima with seven planets attacking the Moon. An enthusiastic Oak armed with this Nyaya runs the simulator and finds seven planets – that include Uranus, Neptune and Pluto – lined up in the sky from east to west in his Mahabharata date, corroborating this analogy!³⁴

Analogies have a special place in Nilesh Nilkanth Oak's claims on 'logical reasoning'. He has QUOTED 27 ANALOGIES ON SHARAD SEASON, each one given as a comparison with a scene of the battle field in the Mahabharata text, to support his claim that Mahabharata war did happen in the sharad season!!³⁵

The slot for THE SECOND HIGHEST NUMBER OF ANALOGIES TESTED BY HIM IN THE SIMULATOR IS COMPETED BY FULL MOON ANALOGIES and the analogies interpreted by him to 'corroborate' solar eclipse on the first day of the war. Having zeroed in on Amawasya as the first day of the Mahabharata war, Nilesh Oak has the compulsion to show corroborative evidence for Full Moon near the end of the war. Among the corroborations for Full Moon, **the classic one** is quoted here. The text describes **Balarama's** arrival on the 18th day of the war to witness the dual between Bhima and Duryodhana and how he **was seated amidst the kings like the full moon in the firmament surrounded by stars**. Nilesh Oak takes this as "*corroborative support for my (his) assertion that the last day of the war was close to the full moon day.*"³⁶ This analogy of the text has offered a great validation of Nilesh Oak's timeline!

But then this makes me wonder how he would have done Ramayana dating. **Ramayana too has numerous analogies** on the sun, the moon and the stars. For instance on the day before redemption of Ahalya's curse, king Sumati on seeing Rama and Lakshmana compares them with the sun and the moon that look similar in the firmament.³⁷ Did Oak interpret this as an eclipse or a full moon? I have not read his Ramayana dating, but I am not averse to naming his technique of using analogies to 'corroborate' the date in the simulator as "NILESH OAK NYAYA" or "Analogy Nyaya."

Analogy Nyaya

Using the Analogy Nyaya, Nilesh Oak has successfully corroborated the solar eclipse on the first day of the war. The text says that the **dust raised by the armies** caused the sun to

³⁴Ibid.

³⁵Ibid. Page 152- 154

³⁶Ibid. Page 122

³⁷Valmiki Ramayana: 1-48-5

disappear. The ‘scientific acumen’ in Nilesh Oak drives him to claim this as corroboration of solar eclipse.³⁸ The text says that **the sun appears as two** (*dvidhabhuta*) and was **ablaze** (*jvalantya*). The astronomer in Nilesh Oak reminds him of the two phenomena *of solar eclipse*, namely the Baily’s beads and solar corona and counts this as yet another corroboration of solar eclipse.

There are better ways to deduce a reference to an eclipse in an olden text like Mahabharata. **Rahu** or **Ketu** would be invariably associated with the sun or the moon in any reference to an eclipse. Even today the eclipses are referred to as ‘**Rahu grasta**’ or ‘**Ketu grasta**’ solar or lunar eclipse. Only after establishing without doubt that an eclipse is mentioned in the text, one must go ahead with checking in the simulator. But *Oak’s methodology is to check the works of other researchers, choose what appeals to him – and in this case as with most other astronomy references he relies on Vartak’s version – and go about picking out any verse that can be manipulated to suit the version.* Oak **does concede** that there is **NO REFERENCE IN MAHABHARATA TEXT TO SOLAR ECLIPSE ON THE FIRST DAY OF WAR,** but it does not stop his ‘logical acumen’ from picking out analogies to allude this phenomenon.³⁹

The most amusing allusion is about **Satyaki** abandoning his car and mounting on **Abhimanyu**’s car to fight against the Kauravas which is described by the text as the Sun and the Moon joining together as “seen on the past / recent (*Gatau*) *Amawasya* day”.⁴⁰ Nilesh Oak calls this as corroborative evidence for solar eclipse. Mere coupling of the sun and the moon does not indicate an eclipse, but rather *Amawasya*. His only recourse is to Voyager simulator and it shows a separation angle of 1.8° between the sun and the moon.⁴¹ Ignoring the easiest way to check the lunar node in the simulator (assuming that Voyager software simulates that) he conveniently requests experts to shed light on what type of eclipse this would have been and turns his attention to manipulating verses to allude an eclipse and claims in the public domain that his Mahabharata date is successfully corroborated by 100 + experiments and references.

Manipulations and lack of fundamental knowledge

Almost all the 75 experiments he has given in the book including the 18 planetary alignments discussed in chapter 7 of his book to corroborate his date of Mahabharata war fails the test in one of the above ways (such as analogies) or poorly supported by manipulated explanations

³⁸“When Did The Mahabharata War Happen?” Page 102

³⁹Ibid. Page 101

⁴⁰Ibid. Page 103

⁴¹Ibid. Page 101

or simply by lack of understanding of the astronomy facts. THE MOST HORRIFYING ‘CORROBORATION’ GIVEN BY NILESH OAK is on Venus doing a ‘parikrama’ near the star Purva Bhadrapada on the first day of Mahabharata war. Interpreting parikrama as circular journey he checks it in the simulator and declares in the book that Venus went round the planet Neptune.⁴²

More astonishing than his claim that Neptune was referred to by Vyasa in the text, is the fact that NILESH OAK WAS ABLE TO LOCATE VENUS (AN INNER PLANET WHICH CANNOT BE SIGHTED BEYOND 47° FROM THE SUN), AT A DISTANCE OF MORE THAN 80° (IN PURVA BHADRAPADA) FROM THE SUN that was located in Jyeshtha on his date of Mahabharata war! If Niles Oak *claims that his sophisticated Voyager software did show this position*, it raises questions on the accuracy of the simulator. If he claims that the simulator is accurate, then HE IS RISKING HIS OWN INTEGRITY FOR, THE SIMULATOR CAN BE MANIPULATED, WHICH IS POSSIBLE BY ALTERING THE BOUNDARY CONDITIONS. This puts under suspicion each one of the corroborations done by Niles Oak through the simulator.

In a shocking demonstration that Niles Oak **has not realised this grave blunder till the time of writing this**, he has come up with a blog recently on 19th April 2019 putting up this position of Venus as objectively testable observation on par with Arundhati observation claiming that it is futile to oppose these two observations.⁴³

LeanJedi / April 19, 2019

Nyaya Sutra 5:1:25

उभयकारणोपपत्तेरुपपत्तिसमः

(If an opposition is offered by showing that both the demonstrations are justified by reasons, the oppositions will be called “उपपत्ति सम (balancing the demonstration).

उपपत्ति सम

An illustration

(1) AV observation is **useful**

(2) because it is an **objectively testable observation**

(3) like ‘Venus doing Parikrama near nakshatra Purva Bhadrapada’

⁴² Ibid. Page 82

⁴³ “Balancing the demonstration”

<https://nileshoak.wordpress.com/2019/04/19/%E0%A4%89%E0%A4%AA%E0%A4%AA%E0%A4%A4%E0%A5%8D%E0%A4%A4%E0%A4%BF-%E0%A4%B8%E0%A4%AE-balancing-the-demonstration/>

The sad fact is that his entire book is ridden with this kind of **absurdities** arising from *absence of fundamental knowledge about planetary and stellar positions*. Added to this is the complete lack of understanding of cultural thoughts and the science of the Vedic society about stellar positions and their impact on mundane life. As one plunges deeper into his blogs and videos in addition to his book, one gets an appalling picture of misuse of Vedic ideas and misinterpretation of the same besides denigrating the gurus, elders and traditions in the name of spreading scientific temper to Indians. Clearly it's time to call a spade a spade. The following pages are dedicated for this task.

Plan of the critique

I begin with presenting the *symbolism of Arundhati* to establish why her iconic stature cannot be sullied. Then I proceed with presenting *Purva paksha* of Nilesh Oak on the Epoch of Arundhati and his methodology and other references divulged at different times in his videos and blogs.

This is followed by *Uttara Paksha* comprising of exposition of the Nilesh Oak's *flaws in his understanding of Mahabharata astronomy, equinoxes and solstices* that are fundamental to positioning Mahabharata time period. This is followed by exposing the *flaws in Oak's methodology of Karl Popper's falsification* and his *methodology on pramāṇa*, and his *faulty understanding of prishṭha and nimitta and Kali Yuga date* that is inviolable.

Then the core topic of exposing the flaws in Oak's simulation of Epoch of Arundhati that ARUNDHATI DIDN'T GO IN FRONT OF VASISHTHA IN THE SAID EPOCH IS DISCUSSED. This is followed by scientific and logical causes that led to the A-V sighting reported by Vyasa and the DECIPHERMENT OF MAHABHARATA CALENDAR TO ARRIVE AT THE DATE OF MAHABHARATA WAR. The next Chapter deciphers the '*Fall*' of *Abhijit* and how the VEDIC CULTURE HAD ITS BEGINNING, AT THAT TIME FOUNDED BY NONE OTHER THAN SKANDA. Finally at the end of this book, a *list of all the manipulations in astronomy data done by Nilesh Oak* to corroborate his date is furnished. This is followed by the mathematical proof given by Dr Harish Saranathan on which of the two stars, Arundhati and Vasishtha, went ahead of the other in the period of the so-called Epoch of Arundhati

In the course of this book, I am purely guided by a desire to set the record straight with reference to Arundhati and the date of Kali Yuga. I may have sounded harsh at times on

Nilesh Oak, but it must be understood that MY AIM IS ESTABLISHING THE TRUTH AND STOPPING THE GULLIBLE AND UNINFORMED READERS FALLING INTO A WORK OF UNTRUTH.

Chapter 1

SYMBOLISM OF ARUNDHATI

“Epoch of Arundhati” being central to the historical dating of Nilesh Nilkanth Oak, the basic question is whether he has done a critical and historical enquiry into who Arundhati was and what she stood for. Since the star (Alcor) is associated with Arundhati who once lived in flesh and blood, any type of reference to the star must be cross checked with the life events of Arundhati to derive the true import of such a reference. In short ANYONE WORKING ON THE STAR ARUNDHATI MUST BE AWARE OF THE SYMBOLISM OF ARUNDHATI TO DO FAIR JUSTICE TO THE RESEARCH UNDERTAKEN AND TO THE IMAGE OF ARUNDHATI AS WELL. The image of Arundhati is of iconic proportions such that her name is found invoked across the country irrespective of the languages spoken and the background of the people. Not many know that the true persona of Arundhati can be known from old Tamil texts!

Arundhati – an icon of third Purushartha.

Arundhati is held as an epitome of PATIVRATĀTVA – a virtue that has no equivalent word in English, except the term ‘chastity’. Interestingly this virtue has a word in Tamil as “**karpu**” with two ancient Tamil texts giving elaborate description of what this virtue stands for. An exclusive chapter on this virtue runs into **53 verses in Tolkāppiyam** while the world famous text, **Tirukkural has devoted 18 chapters with 180 verses** dealing with various facets of a woman of this virtue. The reason for such detailing comes from the fact that it is core of the THIRD PURUSHARTHA NAMELY KĀMA⁴⁴. This virtue is common to both the genders, and one from each gender has been acclaimed for all times in the past. *Among men Rama is cited as a model for this virtue and it is Arundhati among women.* Of the two Rama is revered as a God, and Arundhati has been elevated to the celestial sphere as a star in the constellation called Sapta Rishi Mandala (Big Dipper).

1. Marriage vow of firmness in the name of Arundhati

Taking a vow in the name of Arundhati is an integral part of the VEDIC MARRIAGE. This is done by sighting the star Arundhati before the couple are united in conjugal bliss. This tradition continues in the marriage ceremony of Tamil Brahmins even today giving rise to the

⁴⁴Tirukkural has these chapters compiled under ‘Kāmatthu pāl’, the 3rd Purushartha.

famous phrase in Tamil, “*ammi midhitthu Arundhati pāṛthal*” that combines two rituals of the marriage ceremony. One of them is the ritual of the bride stepping on the grinding stone as a mark of firmness expected of her. This is followed by the other ritual – that of sighting the star Arundhati with a vow of firmness. LIKE ARUNDHATI, THE WOMAN SHOULD NEVER WAVER FROM HER PATH, is the import of this sighting.

The bride is first shown the **Dhruva star** (Pole star) known as a fixed or firm star. She takes a vow that she will be firm, i.e. rooted in her husband’s house. Then she is shown the **Sapta Rishi** formation. From there she is shown **Vasishtha** and then finally **Arundhati**. This practice has lent the name of Arundhati to a philosophical mooring⁴⁵ of reaching the Unknown from the Known. From this one can imagine HOW SPIRITUALLY ROOTED AND CULTURALLY INSPIRING THE ICON OF ARUNDHATI HAS BECOME IN THE HINDU SOCIETY since time immemorial.

Taking the vow of firmness by sighting the Arundhati star can be seen across the fabric of the society, irrespective of the background of the persons. There exists a reference in a Tamil Sangam text⁴⁶ to a **Kṣatriya woman**, the wife of the Chera king taking such a vow. Two verses in **Silappadhikaram** in the context of Kannagi’s marriage⁴⁷ establish that this custom was followed by **Vaishyas** also.

To cap it all an ancient Tamil text called ‘**Tirikadugam**’ – a name originally referring to a combination of three herbs of medicinal value – having in all 100 verses, with each verse giving a combination of three aphorisms, like medicinal Tirikadugam to cure the ills of life, begins THE FIRST LINE OF THE FIRST VERSE THAT A PERSON SHOULD HAVE A WIFE HAVING THE VIRTUE (KARPU) OF ARUNDHATI!⁴⁸ Can there be any better statement on Arundhati that she has been a household name for virtue?

2. The established position of Arundhati as follower of Vasishtha.

In the Hindu society it is customary for **the woman to stand on the right side of her husband**. She won’t be standing exactly in line with him, but a little behind. In that position **her left shoulder would be just behind the right shoulder of her husband**. This is also the customary position of the couple-deities in temple processions. This is the position of the couple when their right hands are united at the marriage ceremony. When the man is taking the right hand

⁴⁵ Arundhati Darshana Nyaya: The technique of gradually moving from the easily perceivable to the lesser perceivable to reach the ultimate Reality to be perceived.

⁴⁶ Padirru pathu: Verse 31- lines 28 & 29.

⁴⁷ Silappadhikaram: Chapter 1- lines 27 & 63

⁴⁸ Tirikadugam: Verse 1, line 1. “Arundhati Karpinār toḷum”. Meaning: Marrying a woman having the virtue of Arundhati

of his bride standing on his right, her position comes a little behind his stretched right hand. That is *the traditional position of the couple in all sacred rites and also when they are walking in public glare*. This is EXACTLY THE POSITION OF THE TWO STARS, VASISHTHA AND ARUNDHATI (MIZAR AND ALCOR) IN THE SKY.



Figure 1: Sapta Rishi Mandala or Big Dipper (Source: Orbitsimulator.com)

The shape of the Sapta Rishi Mandala is that of a big ladle and the above figure is the normal position just above the northern horizon, but below the Pole star. Today this position above the northern horizon is visible only in higher latitudes but it was visible in this position in Hastinapur⁴⁹ until 1000 years ago.

The counting of the seven sages starts from the right - from **Kratu**.⁵⁰ Following the shape from Kratu the sixth star can be located in the upward bend of the handle. It is Vasishtha (Mizar) and closely to his right just behind him is the star Arundhati (Alcor). In the above figure she seems to be 'above' Vasishtha. One can deduce how she would look when the constellation is moving above the pole star, that is, about 180° away from this position. Arundhati would be seen 'below' Vasishtha! *Within 12 hours this constellation covers 180° and appears above the pole star.* It looks like an inverted ladle as shown in the figure below.

⁴⁹The capital of Kuru kingdom, where sage Vyasa met King Dhritarashtra before the Mahabharata war and made an observation about Arundhati star.

⁵⁰The naming of the seven sages in the figure is as per Brihad Samhita: chapter 13. The names were not the same at all times in the past. Since Brihad Samhita is of more recent origin, the naming given in that text has been taken up.



Figure 2 : Changed appearance of Vasishtha and Arundhati after 12 hours

The same figure rotated 180° (Fig 2) shows Arundhati below Vasishtha but not moved a bit away from the alignment with Vasishtha. This change in the appearance is because the entire constellation moves in the same direction, (anti-clockwise) as seen from the earth and rotates around the pole star. In whichever position the constellation may be seen, *the appearance of the star Arundhati remains oriented behind the right side of Vasishtha*. So the observation of this constellation warrants understanding the direction of forward motion of the entire Saptarishi group, from which the forward motion of Vasishtha is ascertained. In any position of this group circling the pole star, Arundhati will always be seen closely to the right side of Vasishtha.



Figure 3 : Sapta Rishi Mandala moves forward in anti-clockwise direction.

Note Arundhati behind Vasishtha to his right. This perception had given rise to a belief that TO BE LIKE ARUNDHATI MEANS FOLLOWING THE FOOTSTEPS OF THE HUSBAND. The virtue associated with Arundhati is *not something that makes the woman subsidiary to her husband*. It

is also not about towing the husband and taking his orders. From the inputs of **Tolkāppiyam** and **Tirukkural** we can deduce that A VIRTUOUS WOMAN ALWAYS HAD HER MIND FOLLOWING HER HUSBAND THROUGH THICK AND THIN. The decipherment of the name Arundhati further reveals this nature of Arundhati that is reflected in the positional alignment between the two stars.

Meaning of the word Arundhati

The word Arundhati comes from the root ‘**rudh**’ which means ‘*to obstruct, check, arrest, stop, restrain, prevent, keep back, withhold*’⁵¹. ‘**Rundhe**’ means obstruct, stop, prevent, block, keep back etc. If the prefix **A** is added, it becomes **Arundhe** which means *not obstruct, not stop, not prevent, not torment, and not block* etc. which ultimately means not coming in the way of someone. This word is found in quite a few places of the Vedic literature says Vedic scholar **R.Ramanathan**⁵². Quoting the word “**avārundhe**”⁵³ from **Taittirīya Brahmana** he says that it is a combination of AVA AND RUNDHE WHICH MEANS ‘WITHOUT OBSTRUCTION’. From this it is deduced that by her very name Arundhati, she exhibited a quality of not obstructing. Not obstructing what is the question coming out of this. Since she is praised as the **sahadhamini**⁵⁴ of Vasishtha, her name implies that *she has not obstructed the dharma (duty) of her husband and has stood by him enabling him to carry out his duties*. It is ‘**tapas**’ for the sake of Dharma that Arundhati explains in a context where she gives the etymology of her name, Arundhati!

Once the seven sages (Sapta rishis) and Arundhati along with two aids named **Ganda** and **Pasusakha** were confronted with a demoness by name **Yātudhāni**. They were asked to identify themselves to escape slaughter by Yātudhāni. When Arundhati’s turn came she said the following verse as the meaning of her name.

[Arundhati]

dharām dharitrīm vasudhām bhartus tiṣṭhāmy anantaram
mano 'nurundhatī bhartur iti mām viddhy arundhatīm⁵⁵

[अरुन्धती]

धरां धरित्रीं वसुधां भर्तुस तिष्ठाम्य अनन्तरम्

मनो ऽनुरुन्धती भर्तुर इति मां विद्ध्य अरुन्धतीम्

⁵¹ Literary source: Rig Veda

⁵² R. Ramanathan has been studying Krishna Yajur Veda, Mimamsa and Lakshana for the past 8 years and teaches Krishna Yajur Veda in Bangalore.

⁵³ 8th Prasna of the 3rd ashtaka of the Taittirīya Brahmana.

⁵⁴ Sahadhamini means wife who shares duties or dharma of her husband.

⁵⁵ Mahabharata: 13-95-39 <http://www.sacred-texts.com/hin/mbs/mbs13095.htm>

Meaning: “Arundhati said, ‘I always stay by the side of my husband, and hold the earth jointly with him. I always incline my husband’s heart towards me. I am, for these reasons called **Arundhati!**’”⁵⁶

The term “**mano 'nurundhati**” in the above verse is explained as “**manaha arundhati**” by Vedic scholar R. Ramanathan, meaning ‘**holding onto without slipping**’. She came to be known as Arundhati because **SHE NEVER SLIPPED AWAY FROM HER POSITION OF FOLLOWING HER HUSBAND**, thereby not obstructing his way. A parallel deduction out of this is that **SHE CAN NEVER GO IN FRONT OF HIM!** A star found in a coupling with another in a similar fashion and not obstructing its path came to be celebrated as the star couple Arundhati and Vasishtha!

Elsewhere in the same chapter **Arundhati** tells about what she thinks is wealth.

[Arundhati]

dharmārthaṃ saṃcayo yo vai dravyāṇāṃ pakṣasaṃmataḥ
tapaḥ saṃcaya eveha viśiṣṭo dravyasaṃcayāt ⁵⁷

Vedic scholar **R.Ramanathan** translates this as follows:

“Arundhati says, ‘In this world there are some people who say wealth can be accumulated for the sake of Dharma. But according to me, if anything ought to be accumulated for Dharma, it should be tapas.’”

Arundhati equates Tapas with wealth and expresses her steadfast nature of clinging to tapas as a way of upholding Dharma. ***Her Dharma is Pativratātva and following that is her tapas.*** The characterisation of Arundhati is such that it was **HER TAPAS NOT TO SLIP AWAY OR CHANGE FROM HER POSITION AT ANY TIME.**

The sages, by naming a star (Alcor) as Arundhati have sent a clear message that the star never deviated from its position, and never went ahead of Vasishtha (Mizar), by obstructing its path. This identification is absurd if Arundhati had ever deviated from her tapas, from Dharma or if ever the star Alcor had deviated from its path in the sky and had walked in front of Mizar (Vasishtha) which is akin to obstructing its path.

⁵⁶Translation by Kisari Mohan Ganguli <http://www.sacred-texts.com/hin/m13/m13b058.htm>

⁵⁷<http://www.sacred-texts.com/hin/mbs/mbs13094.htm>

Mahabharata: 13-94-32

[अरुन्धती]

धर्मार्थं संचयो यो वै द्रव्याणां पक्षसंमतः
तपः संचय एवेह विशिष्टो द्रव्यसंचयात्

1. Earliest reference to unwavering Arundhati.

The recognition of this unwavering position of the Arundhati star was first reported at the *time of the 'fall' of the star Abhijit (Vega)*. While recounting the birth of **Kartikeya**, the sage **Markandeya** describes the events that resemble a catastrophe by fire. The narration of certain celestial positions in that context reveals some interesting events of the Vedic society. One of the revelations was the recognition of the unwavering position of Arundhati with reference to Vasishtha in the sky.⁵⁸

The narration tells about a woman by name **Svaha** who was in love with **Agni**. Since she could not approach Agni in her original self, she impersonated the wives of the six rishis from among the seven rishis (Saptarishi) and cohabited Agni. Only Arundhati remained difficult to be impersonated as she was steadfast in her devotion to her husband. When the other rishis came to know that their wives have been impersonated, they abandoned their wives. The abandoned six women, who were originally the wives of six rishis, were designated as the six mothers of **Skanda**, who was born of that cohabitation of Svaha and Agni. The six mothers were collectively known as the constellation **Krittika** in the sky. It was around that time ŚAKRA (INDRA) TELLS SKANDA THAT THE STAR ABHIJIT HAD FALLEN from its position by retiring to woods and was needed to be replaced by another star.⁵⁹ And the constellation of KRITTIKA WAS ASSIGNED A PLACE IN THE HEAVENS TO COMPLETE THE NUMBER.

This story indicates that two events were simultaneously noticed - they being ARUNDHATI LOOKING UNCHANGED IN HER POSITION (which pre-supposes continuous observation of the sky for several millennia before that) and the fall of Abhijit. The fall of Abhijit as a pole star gives ample scope to deduce the time period from when onwards Arundhati had been held in high esteem in celestial spheres. In the present context of symbolism of Arundhati the essence of the above story narrated by Markandeya is found to be immortalised in a *ritual of Vedic marriage*.

2. Arundhati in marriage mantra.

Sighting Arundhati star on the evening of the third day of marriage was in vogue in olden days as part of nuptial rites. Today this is incorporated on the day of marriage itself. The interesting part of this rite was inclusion of the Krittika star, identified as the six wives of the six rishis in the mantra of sighting Arundhati. The sighting is done after the ritual of the bride, stepping on a grinding stone as a mark of firmness and stability in the new home.

⁵⁸Mahabharata: 3-224 <http://www.sacred-texts.com/hin/m03/m03224.htm>

⁵⁹Mahabharata: 3-229 <http://www.sacred-texts.com/hin/m03/m03229.htm>

Sighting of Arundhati done after this also conveys the same objective. In **Gobhila's Gruhya Sutra** THE BRIDE ADDRESSES ARUNDHATI AS "RUDDHA AHAM ASMI", MEANING 'I AM RESTRAINED'.⁶⁰ IF ARUNDHATI IS SOMEONE WHO HAD DEVIATED FROM HER PATH AS NILESH OAK CLAIMS, THIS RITUAL COULD HAVE BEEN DISPENSED WITH LONG AGO.

There are differences between different sutras on who recites the particular mantra of this rite – the bride or the bridegroom. Here I am giving the ritual prescribed by **Apastambha**. This rite begins by sighting *Dhruva* nakshatra (pole star) by the couple. *Dhruva* is praised as of stable origin and stable existence holding the stars together around it. The bridegroom shows the pole star to the bride and prays that the bride is fixed in his home just like the pole star fixed in the firmament.

Then he shows her the star Arundhati in the Saptarishi Mandala and says that the bride becomes the eight one after Arundhati who shines along with Kritika stars. In this mantra Arundhati is addressed as being stable along with the six Kritika stars. Kritika and Arundhati together form the group of spouses of seven sages. It is desired that the bride becomes the 8th one after these seven and be stable and fixed in her husband's home.

Of the seven, only Arundhati had stayed where she was earlier. Others have moved away. Based on the marriage mantra on Arundhati, it is deduced that the spouses of the six rishis were once identified collectively with the star Abhijit who was referred to as the younger sister of Rohini. When she was found to have fallen, the Vedic sages decided to locate a permanent group of six and zeroed in on Kritika constellation. Arundhati had stayed put in the Saptarishi mandala. Kritika as a group of six also had not severed away from its location. Invoke all of them as role models for the new bride coming along with the groom – this is the idea behind the sighting of Arundhati ritual whose beginnings can be traced to a time Abhijit was replaced by Kritika from the group of stars of cultural relevance.

This mantra on Arundhati is followed by mantras that convey stability. The Rig Vedin recites the mantra "**dhruvā dyaurdhruvā...**"⁶¹ that says that the heavens, the earth, the mountains and the entire Universes are permanently stable. Let the bride also be permanently stable in his home. By invoking this mantra, the idea or **ideal of stability** is reinforced. By positioning the Arundhati rite after the rite of the bride stepping on the grinding stone, firmness is reiterated. Thus it can be seen that the grinding stone and Arundhati have been chosen as symbols of steadiness and unwavering nature. IF EVER ARUNDHATI HAD MOVED AWAY AND GONE PAST

⁶⁰Gobhila Gruhya Sutra, II, 3,10 as given in "Essays On Indo-Aryan Mythology –Vol" by Aiyangar Narayan.

⁶¹Rig Veda: 10-173-4

VASISHTHA, AS NILESH OAK THINKS, THEN SHE WOULD NOT HAVE FOUND A PLACE IN THE MARRIAGE MANTRAS TO SYMBOLISE FIRMNESS!

That any deviation in the position of Arundhati was not at all perceived in Mahabharata times is revealed by Bhishma on arrow bed when he narrated the story of a woman called **Sāndli**– a *pativratā like Arundhati* – who was elevated as a star, much like Arundhati, in the celestial sphere.

imaṃ dharmapathaṃ nārī pālayantī samāhitā
arundhatīva nārīṇāṃ svargaloke mahīyate⁶²

Meaning: “*That woman who with concentrated attention, adheres to this path of duty, becomes the recipient of considerable honours in heaven like a second Arundhati.*”⁶³

Earlier in the text, **Sanjaya** also recognises Sāndli and her position in the sky over the three summits of mountain **Shringavat**⁶⁴ located to the south of **Airavata Varsha**.⁶⁵ If it is true that Arundhati had walked ahead of Vasishtha much against the dharma of *pativratā* during Mahabharata times, there is no logic in Bhishma’s version of the comparison with Arundhati. He could have just stopped with describing the qualities of Sāndli. He could even have talked about the deviation in the path of Arundhati, and contrasted it with Sāndli’s unwavering position in the sky. But none of this had happened, which only goes to show that **ARUNDHATI CONTINUED TO APPEAR IN THE SAME PATH OF FOLLOWING HER HUSBAND IN MAHABHARATA TIMES.**

There were times when Arundhati appeared differently and those changes have found their way into the Epics. She has been variously perceived as being angry or picking up a fight with Vasishtha etc. *but never was she found to have obstructed the path of Vasishtha by going in front of him* – an act or appearance that is anathema to her very persona and the very meaning of her name and existence. If ever she had walked ahead of her husband, as Nilesch Oak claims, it would have been construed as obstructing his path – which a *pativratā* would never do. In that case **SHE WOULD LOSE HER EMINENCE AS A PATIVRATĀ AND GET DEMOTED.** She could no more be recognised in Vedic marriages. **If at all she has deviated from her path, the Vedic sages could have spotted some other star as Arundhati – like they picked out Krittika stars – for stability and unwavering position as a star signifying a rishi-patnī.**

⁶²Mahabharata: 13-124-20 <http://www.sacred-texts.com/hin/mbs/mbs13124.htm>

इमं धर्मपथं नारीपालयन्ती समाहिता

अरुन्धतीवनारीणां स्वर्गलोके महीयते

⁶³Mahabharata: 13- 123 <http://www.sacred-texts.com/hin/m13/m13b088.htm>

⁶⁴ Mahabharata: 6-9-9 “tatra svayamprabhā devī nityaṃ vasati śāṇḍilī”

⁶⁵ Mahabharata: 6-9-10 <http://www.sacred-texts.com/hin/mbs/mbs06009.htm>

The fact that it did not happen goes to show that Arundhati was never found to have gone ahead of Vasishtha.

Vyasa's nuanced reference to Arundhati

However for the first time we come across a reference to a revolting position of Arundhati by putting Vasishtha at her back in the words of sage Vyasa while describing the bad omens to King Dhritarashtra just before the Mahabharata War commenced.

Vyasa says,⁶⁶

yā caiṣā viśrutā rājaṃs trailokye sādhu saṃmatā
arundhatī tayāpy eṣa vasiṣṭhaḥ prṣṭhataḥ kṛtaḥ

This means,

*“She, O king, who is celebrated over the three worlds and is applauded by the righteous, even that (constellation) Arundhati keepeth (her lord) Vasishtha on her back.”*⁶⁷

This verse is the only source or the only reference that Nilesh Oak has taken as pivotal to ascertaining the date of Mahabharata war. This appearance of Arundhati has been mentioned by Vyasa as *one among several nimittas* (omens) seen all around at three levels, namely terrestrial, atmospheric and celestial.

One can find a definite plan in this particular verse on Arundhati. *Vyasa has employed a clever trick (yukti) to help decipher what he is coming to say in this verse*. This kind of trick is totally absent in his description of other omens.

In the first line of this verse he makes a statement that describes a **universal truth** about Arundhati accepted by one and all across all ages. It says that she is being praised in all the three worlds, OBVIOUSLY FOR NOT OBSTRUCTING THE PATH OF VASISHTHA by keeping him at her back.

But the second line says that she had kept Vasishtha at her back – which is not what the very name Arundhati stands for.

⁶⁶Mahabharata: 6-2-31

याचैषाविश्रुताराजंसतरैलोक्येसाधुसंमता

अरुन्धतीतयाप्येषवसिष्ठःप्रष्ठतःकृतः

⁶⁷ Mahabharata: 6-2-31 <http://www.sacred-texts.com/hin/m06/m06002.htm>

Of these two statements, *if we take the first one as true then the second statement is absolutely false.* THAT MEANS THE SIGHTING OF KEEPING VASISHTHA AT HER BACK WAS A TEMPORARY PHENOMENON.

If we accept the second statement as true, then the first statement must be false for, *the one who had kept Vasishtha at her back could not have been praised as Arundhati in all the three worlds by righteous people.*

By keeping the inherent incompatibility and contradiction between the two statements within the same verse and by relating one with the other, Vyasa had delivered the judgement at that time itself – on which of the two statements is eternally true.

But unfortunately the second statement was picked up by Nilesh Oak as “**Shabda Pramāṇa**”⁶⁸ with utter disregard to what constitutes a Shabda Pramāṇa and how it cannot be a Shabda Pramāṇa. TREATING THE ARUNDHATI OBSERVATION AS SHABDA PRAMĀṆA, HE SEEKS TO FALSIFY ANOTHER SHABDA PRAMĀṆA IN THE SAME VERSE ON THE SYMBOLISM OF ARUNDHATI! Without solving the contradictory connotations for the same persona, of which the first statement (in the verse) is universal and continues to be applauded in the Vedic society, Nilesh oak had gone ahead assuming the second statement to be a stable reference to a stellar event, and checking it in the astronomy software, came to the conclusion that the star Arundhati had walked in front of Vasishtha (thereby keeping him at her back) for more than **6000 years from 11091 BCE to 4508 BCE**. He has placed the date of Mahabharata war within this period, in 5561 BCE and Ramayana before this period. He claims that Ramayana did not take place any time after 10,000 BCE and Mahabharata did not take place any time after 4,500 BCE.⁶⁹

Had Vyasa truly referred to a phenomenon that was going on for thousands of years when he made this statement, it gives rise to contradictions within the Mahabharata text. It makes *Bhishma’s narration of Sāndli as another Arundhati absurd.* It also makes *Kunti’s blessings to Draupadi to be like Arundhati ridiculous.*

Did Kunti wish her sons to tow behind Draupadi?

Vasishtha was towing behind Arundhati at the time of Draupadi’s marriage, if we are to accept in Nilesh Oak’s version for the year of Mahabharata war. If Nilesh Oak is right then

⁶⁸“When Did The Mahabharata War Happen?” Page 70

⁶⁹<https://www.myind.net/Home/viewArticle/ramayana-did-not-take-place-any-time-after-10000-bce-and-mahabharata-did-not-take-place-any-time>

Kunti was wrong, for, she advised Draupadi soon after her marriage to remain ‘*anuvrata*’⁷⁰ (devoted to her husband’s) like Arundhati.

Kunti says,

“Be thou unto thy husband as Sachi unto Indra, Swaha unto Vibhavasū, Rohini unto Soma, Damayanti unto Nala, Bhadrā unto Vaisravana, **Arundhati unto Vasishtha**, Lakshmi unto Narayana.”⁷¹

How should we interpret the above blessing of Kunti? Did she wish Draupadi to follow her sons (Pandavas) like Sachi, Rohini, and Arundhati etc. or put all her sons (Pandavas) behind her, i.e. at her back, like Arundhati of her times who walked in front of Vasishtha?

The above analogy expressed by Kunti was also used by Sita in her reply to the demonesses at Ashoka Vana.⁷² Sita also used the same expression “*anuvrata*” (*Ramam Patim anuvrata* - devoted to husband Rama)

“Like the highly fortunate Sachi who waits upon Indra, like Arundhati on Vasishtha, like Rohini on the Moon God, like Lopamudra on Agastya, like Sukanya on Chyavana, like Savitri on Satyavanta, like Srimati on Kapila, like Madayanti on Saudasa, like Kesini on Sagara, like Damayanti the daughter of Bhima, devoted to husband Nala, in the same way I am devoted to my husband Rama, the best in Ikshvaku dynasty.”

What was the position of Arundhati when Sita expressed the above?

According to Nilesh Oak, Ramayana happened much before Arundhati’s walk in front of Vasishtha (obstructing his path) and based on that he puts the Rama-Ravana war at 12,209 BCE. As per his theory, Arundhati was behind Vasishtha at that time. So Sita had alluded to following her husband much like Arundhati following Vasishtha. Like Sita, Draupadi was also an **anuvrata** – devoted to her husband. The common symbolism of Arundhati for both doesn’t match with Nilesh Oak’s assertion that Arundhati of Mahabharata times was different from how she looked at the time of Ramayana.

Nilesh Oak’s theory of difference in the position of Arundhati in the periods of the two Epics raises three questions.

⁷⁰Mahabharata: 1-191-7 <http://www.sacred-texts.com/hin/mbs/mbs01191.htm>

⁷¹ Mahabharata: 1-201 <http://www.sacred-texts.com/hin/m01/m01202.htm>

⁷²Valmiki Ramayana: 5-24-10

- The one who was Arundhati during Ramayana became *Rundhati* during Mahabharata and once again became Arundhati at the current times. Why then was she recognised as Arundhati and not *Rundhati* in the Mahabharata?
- Why Arundhati was not replaced by some other stable star as a Pativrata by great sages such as Vyasa, Bharadwaja, Parasara, Garga and others who lived in the period, if the star was seen moving ahead of Vasishtha?
- Of the two women Sita and Kunti, should we say that Kunti was a dullard for parroting the Arundhati dialogue of Sita by not keeping herself abreast of the changed position of Arundhati going on for thousands of years? Arundhati in front of Vasishtha was irrelevant at the time of Mahabharata to be invoked in blessings. Why then Kunti invoked her in her blessings for her daughter in law?

These questions arise if we accept Niles Oak's revolutionary theory of Arundhati Epoch. However the reality picture is encapsulated in Kunti's blessings in the next verse to Draupadi in wishing Draupadi to be the '**yajnapatni**' – waiting on her husbands engaged in the performance of sacrifices. This is precisely THE SAME DESCRIPTION FOR THE ETYMOLOGY OF ARUNDHATI I explained in the beginning of this chapter. *The yajnapatni will be closely behind her husband and not in front of him as if obstructing his yajna*. Niles Oak's claim of change in the position of Arundhati is at variance to Kunti's blessings.

History of Arundhati within the history of Mahabharata

Basically Niles Nilkanth Oak's historical dating is not much to do with the history of Mahabharata as it does with the history of Arundhati! Any claim of success for his dating of Mahabharata automatically means demolition of the history of Arundhati. ARUNDHATI'S HISTORICITY IS WELL ATTESTED BY THE FACT THAT HER IMAGE IS DEEP-ROOTED IN THE COLLECTIVE CONSCIOUSNESS OF THE SOCIETY RIGHT FROM THE TIMES OF SITA, THROUGH KUNTI AND UNTIL NOW. The collective consciousness of who we are now is ultimately traced to the olden pages of history – in the current context - to the idea of Arundhati, *an idea that Niles Nilkanth Oak seeks to destroy*.

Any write-up on history or dating history cannot ignore the sense of identity that continues to exist in a society, originally given by the very history or historical character that one is working with. As rightly told in "A Manual of historical Research Methodology",⁷³

"History is to the community what memory is to the individual. When a man loses memory, he loses a sense of identity, or orientation, which renders him helpless in finding his bearings,

⁷³Sreedharan, (2007). "A Manual of Historical Research Methodology", South India Studies. Page 3

adjusting himself to peoples and taking intelligent decisions about anything. History enables the society and the individual within that society to take bearings, orientate, and to establish a sense of identity. Concluding his social necessity argument, Professor Marwick writes:

“Thanks to our knowledge of history we find that instead of being totally adrift in an endless and featureless sea of time, we do have some idea at least of where we are and of who we are.”

With the present evidence of Arundhati Vow taken at the time of marriage, having its genesis in the past existence of an iconic Arundhati, any researcher must tread carefully while putting to test a character such as Arundhati. Starting from this crucial analysis that is found missing in his book, many other features in the book of Nilesch Nilkanth Oak are *woefully lacking in integrity or in substance*. Before exposing them all, let me first explain the entire theory of Nilesch Oak as *Purva paksha* in the following pages.

PURVA PAKSHA

Chapter 2

NILESH NILKANTH OAK'S THEORY OF ARUNDHATI EPOCH

Nilesh Oak was drawn into dating the two Epics of India, much excited by the problems that they have thrown up.⁷⁴ He noticed enormous number of astronomy references in the two Epics, more than 800 in all, but felt that not all of them were taken into account and researched. So he decided to enter the fray to add his own to the already existing multiple claims— some 130 of them - on the date of Mahabharata war. After he had published his book on the date of Mahabharata War by solving the Mystery of Arundhati and formulating the **“EPOCH OF ARUNDHATI”** *he had given a number of newer explanations and inputs about this Epoch and his methodology in his blogs and videos released later*. All these are combined and presented here in a concise manner.

His assumptions.

Nilesh Oak begins his book by stating the problem at hand – it is to determine the date of Mahabharata war. Then he continues to state his assumptions. Oak thinks that

“assumption requires only the agreement of the respondent (or the reader in my case) and carries with it no burden of proof on either side.”⁷⁵

The first assumption was about the accuracy of the Voyager software he used. The 3rd assumption was that the “Nakshatra system of time reckoning was well established at the time of Mahabharata war”⁷⁶. The remaining ones are about the reliability of the Mahabharata text and its contents.

His theory

Nilesh Oak's theory has three theses. They were⁷⁷

1. All astronomy observations of Mahabharata were ‘*visual observations*’ of the sky.

⁷⁴<https://www.youtube.com/watch?v=RedV48OCEfg>

⁷⁵“When Did The Mahabharata War Happen?” page 11.

⁷⁶Ibid. Page 13

⁷⁷Ibid. Page 14

2. “Mahabharata astronomers *had means to observe objects* in the sky, which would not be otherwise visible to the naked eye.”
3. “Mahabharata author’s motivation for noting down specific astronomy observations during and around the time of Mahabharata war was *to create records of the timing of the Mahabharata war.*”

Astronomy Basics.

Nilesh Oak has given a list of astronomy basics to help the reader get familiar with the concepts he is going to use in the book. He introduces terms like precession of equinoxes, celestial pole shifts and makes a significant idea that **the tropical year** measuring the cycle of seasons keeps moving at the rate of 20 minutes per year and covers approximately one year in 26,000 years. This means after one full cycle of 26,000 years “the positions of the seasons relative to the orbit are ‘back where they started’”.⁷⁸ This means “**every 2000 years**, the beginning of a **season precedes by one lunar month.**”⁷⁹

Mahabharata astronomy.

Nilesh Oak describes the Mahabharata astronomy of which the salient ones are given below.

- He uses the term ‘Mahabharata calendar’ in a broader context of day, month etc. and concedes that *5-year Yuga period* was followed, though he is not sure when the year began. He says, “*Mahabharata is thus not explicit regarding the beginning of the year.*”⁸⁰ He cites Bhishma referring to ‘insertion of two Adhika masa’ in the 5 year Yuga.
- Each season is made of *2 lunar months*.
- He refers to Nakshatras as wives of moon and observation of *moon’s position across the nakshatras at night provided an opportunity to keep track* of the progress of time.
- Direct observation of the Sun near a nakshatra was impossible and thus it is *inferred from the position of the nakshatras before sunrise and after sunset*.
- Among the nodes of the moon, *Rahu is an area of the sky* as opposed to a specific point.⁸¹
- *Retrograde motion of a planet is the oblique motion of the planet* while crossing the ecliptic at an angle.⁸²

⁷⁸Ibid. Page 19.

⁷⁹Ibid. Page 39.

⁸⁰Ibid. Pages 31-32

⁸¹ Ibid, Page 36.

⁸²Ibid. Page 37

- The *magnitude* of a star was calibrated by assigning *zero value to the magnitude of Vega (Abhijit)*⁸³.

He thinks observations can be interpreted in multiple ways. E.g.: Sun and the Moon can be visualised as fighting against each other on a full moon day at sun set or sunrise.⁸⁴

Methodology

In his book Nilesh Oak often makes reference to 'FALSIFIABILITY' of a theory – a concept proposed by **Karl Popper**. What is implied is that a hypothesis must be tested by single or singular statements so that it can be proven true or false. He finds the visual observation of Arundhati- Vasishtha by Vyasa as a fit case of falsification. He says,

“Intuitively I felt that Arundhati was a factual observation since I could not come up with a rationale on the part of the original author of Mahabharata (or on the part of later authors) to write or insert something that would be impossible, as they could have always gotten away with mentioning few conjunctions of planets with each other or the with nakshatras. I found it fascinating that my approach to this problem was very much along the lines of ‘testability’, ‘falsifiability’ and ‘simplicity’ as espoused by Karl Popper.”⁸⁵

Apart from this he **does not propose** any specific research model or methodology **in his book**. However he often talks about a methodology in his videos and blogs for dating Mahabharata war. He compared the methodologies of sage Patanjali, Karl Popper and Richard Feynman and arrived at a combination.

Impressed with Patanjali’s maxim, “*pratyakṣa-anumāna-āgamāḥ pramāṇāni*”, he decided to adopt it but preferred to interpret it in his own way. He picked up Popper’s idea of shapes for degrees of testability to frame a *Triangle of Explanation-Prediction – Testing*. He combined this with Patanjali’s three Pramānas namely Pratyaksha, Anumana and agama. While combining, he changes the generic term ‘*pramāna*’ of Patanjali (used in the same sense in all the other *Astika Darshanas* too) into a component and translates it as “‘Insight’ or ‘Explanation’, instead of merely ‘proof’, ‘evidence’ or ‘testimony.’”⁸⁶ He regards this as representing the corner point of ‘Explanation’ of Popper’s Triangle.

So now he has *three corners of Popper’s triangle with Pramāna, Anumana and Pratyaksha*. He describes AGAMA AS “ESTABLISHED KNOWLEDGE, ASSUMPTIONS, TRADITIONAL DOCTRINE &

⁸³Ibid. Page 39

⁸⁴ Ibid. Page 39

⁸⁵Ibid. Page 58.

⁸⁶“Scientific Method: Elegant & Intricate” <https://nileshoak.wordpress.com/2015/01/11/scientific-method-elegant-intricate/>

PRECEPTS” BUT DOES NOT WANT TO ACCEPT AGAMA BECAUSE HE THINKS IT HAD LANDED HUMANITY IN BIG TROUBLE WHEN MISUNDERSTOOD.⁸⁷

On the other hand, anytime ‘Agama’ was misunderstood and was interpreted as ‘knowledge beyond doubt, skepticism or criticism’, humanity has landed in big trouble.

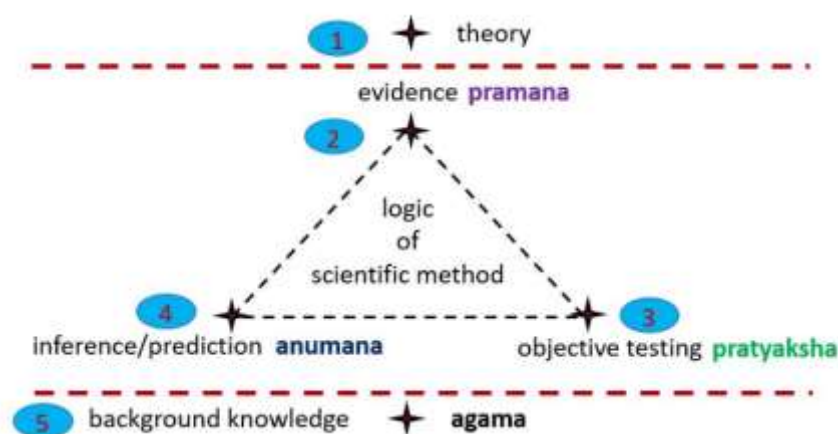
To justify this he cites two instances of which the first one pertains to the case of Aristotelian science turning into a dogma.

- Christianity included Aristotelian science as part of their Holy literature, turning it into dogma (i.e. to be accepted uncritically aka not to be questioned), it stagnated growth of knowledge and ensued dark age of Science in Europe.

As a second reason he says that some traditions had modified ‘agama’ into ‘Shabda’ and caused dogmatic insistence thereby leading India into Dark Age of Science. To quote his words,⁸⁸

- It appears that some of the Indian traditions modified Patanjali’s original ‘Pratyaksha-AnuMana-Agama-Pramana’ into ‘Pratyaksha-AnuMana-Shabda’ as means of ‘Pramana’. These traditions twisted this further by ignoring (or forgetting) the necessity of triangulation and also intrinsic role of ‘Pramana’ as part of this triangulation. Worse, they emphasized limitations of ‘Pratyaksha’ and ‘AnuMana’. This by itself was not wrong as they were emphasizing the trivially true! However the worst part of this twisting was their dogmatic insistence on Shabda (Authority-read-uttarance/opinion of Gurus, Godmen, Teachers, Professors, elders) that, IMHO, led to Dark Age of Science in India.

After eliminating Agama or Shabda, his scientific methodology is built on the Triangulation of Popper substituted with Pratyaksha, Anumana and Pramāṇa as follows.⁸⁹



⁸⁷Ibid

⁸⁸ Ibid

⁸⁹On the chronology of Mahabharata War: 5561 BCE vs 3067 BCE – Part 3<https://nileshoak.wordpress.com/2018/09/13/on-the-chronology-of-mahabharata-war-5561-bce-vs-3067-bce-part-3/>

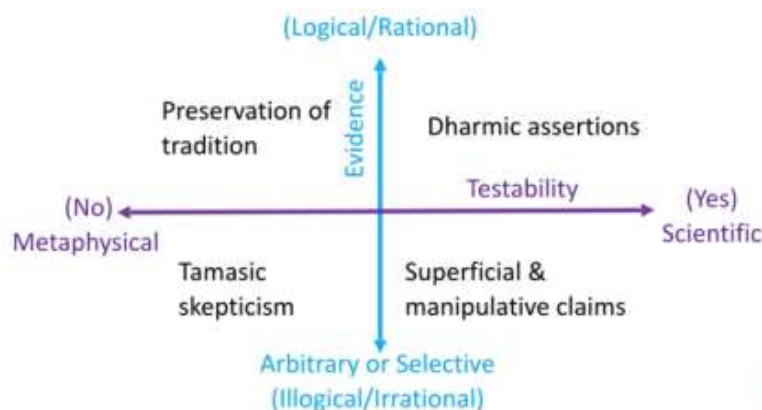
The methodology starts from Theory (1) which is about all the astronomy references in the Epic. That is again repeated as Pramāṇa (2), tested by means of astronomy simulations and mathematical calculations (3), inferences are made from them (4) and all these are supported by background knowledge (5) which consists of concepts of modern and Indian astronomy. This has replaced Agama, though Agama is mentioned in the above diagram.

His explanation of the above diagram in his own words is given below:⁹⁰

Here is the necessary information about my theory as it relates to 5 key elements of the scientific method:

1. All astronomy observations of the Mahabharata text are visual, actual, factual observations of the sky of the Mahabharata times.
2. All astronomy and associated observations from the Mahabharata text add up to 300+ and all of them must be objectively tested.
3. Objective testing was carried out with the help of mathematical calculations and/or astronomy simulations (e.g. Voyager 4.5)
4. Inferences (or corroboration for existing inference) were drawn based on triangulation of evidence via objective testing. Each piece of evidence was tested either individually or in a group (as appropriate) and the inferences were drawn based on logical reasoning.
5. The background knowledge includes modern astronomy, Indian astronomy, Luni-solar calendar, the precession of the Earth's axis and proper motions of the stars.

Accordingly he says, *the testable evidences are logical and scientific and therefore Dharmic assertions*. If not they are metaphysical. If the evidences are illogical and arbitrary and lack testability, they are superficial and manipulative claims only. He describes this in the following diagram.⁹¹ By this model he asserts that the evidence of Arundhati walking ahead of Vasishtha, tested by him successfully in his simulator, he has proved its higher degree of relevance as an evidence to date the War.



⁹⁰Ibid.

⁹¹<https://www.youtube.com/watch?v=RedV48OCEfg>

Rejects traditional Kaliyuga date

In his research done with this methodology he does not find any evidence for the traditional date of Mahabharata war which was 36 years behind the start of Kali Yuga date in 3102 BCE.⁹²

Mahabharata text does not have any astronomy, chronology or other such evidence that would allow one to arrive at 3102 BCE as the beginning of Kaliyuga.

As a result **HE FINDS THE TRADITIONAL DATE AS AN ASSUMED STATEMENT OF SUBTRACTING 36 YEARS FROM KALI YUGA DATE.**⁹³ For this reason *he does not accept the version of Aryabhata in Aryabhatiya as an evidence of Kaliyuga start date.*⁹⁴

(1) One of the verses from Arayabhatiya (astronomy treatise) of Aryabhatta states that Aryabhatta was 23 years old when 3600 years of Kali-Yuga has elapsed.

Many researchers employ above reference to infer that therefore Aryabhatiya was written in year 499 CE and that Aryabhatta was born in 476 CE. However these researchers do not tell us from where they acquire this assumption of 3102 BCE as the beginning of Kali-Yuga, if that very information was used to decide the timing of Aryabhatta (or timing of composition of Aryabhatiya).

He wants independent references, independent of Aryabhatiya and independent of the assumption of 3102 BCE as the Kali Yuga start date.

However he says in his book,

“I want to re-emphasise that I am not objecting to 3102 BC as the beginning of Kali Yuga. When exactly Kaliyuga began is a separate subject and worthy of investigation, however, I consider it outside the scope of this book.”⁹⁵

The Epoch of Arundhati

Nilesh Oak develops his version of dating the Mahabharata by looking at the astronomy references in Mahabharata. For this he picks up a huge canvass of time based on a reference to Arundhati in the words of sage Vyasa at the beginning of Mahabharata war.

As the two warring sides assembled in the battle field, Vyasa talked in private to Dhritarashtra. In the course of this narration Vyasa says (in Nilesh Oak’s translation)

⁹² “How the year of Mahabharata war got linked with the beginning of Kaliyuga.”
<https://nileshoak.wordpress.com/2016/07/10/how-the-year-of-mahabharata-war-got-linked-with-the-beginning-of-kaliyuga/>

⁹³ Ibid

⁹⁴ “Beginning of Kali-Yuga – Assertions & Chaos: Part 1”
<https://nileshoak.wordpress.com/2014/01/17/beginning-of-kali-yuga-assertions-chaos-part-1/>

⁹⁵ “When Did The Mahabharata War Happen?” Page 146

“My dear King, *Arundhati* (saintly wife of *Vasishtha*) who is revered by the righteous all over the three worlds, has left her husband *Vasishtha* behind.”⁹⁶

Oak was fascinated by this when he read this for the first time in the Rutherford library of University of Alberta. *He treats this as an astronomy event and as “Shabda Pramāṇa”*. Using the astronomy software he found that *Arundhati* was seen moving in front of *Vasishtha* at the meridian (perhaps at Hastinapur) for more than 6000 years, from 11091 BCE to 4508 BCE. He calls this period as “THE ARUNDHATI EPOCH”. By this he deduces that *Mahabharata must have happened only within this period and not later than 4508 BCE*.

On Omens.

Nilesh Oak does *not treat the A-V observation of Vyasa as an omen anywhere in his book*, but writes about it in his blogs a few years later. On the question of how an omen could run into many thousands of years, he thinks that **an omen is a non-regular and non-ordinary observation**. Since this omen had not occurred anytime in the past except 6000 years, it is fit to be called as an omen. (However it re-appears again in future in another 11000 years)⁹⁷ And by his theory he has made the omen testable and therefore scientific. In his own words,⁹⁸

The outcome of our testing tells us that AV observation was indeed a non-regular and non-ordinary observation of the sky, When one takes into account, beginning with today (13 September 2014) and going back into antiquity for say 10,00,000 years. We can go back, even further, in antiquity, but million years would suffice for our subject under discussion.

What we have done is made the theory of Omen testable (and thus scientific) and a consequence of that testing is leading us to the knowledge (at least a knowledge claim) that there existed a tradition of ancient astronomy observations that spanned for thousands of years (and our testing tells us that more than 6000 years prior to the time of Vyasa, and thus Mahabharata).

Only way Vyasa would have been aware of this phenomenon (*Arundhati* walking BEHIND *Vasistha*) would be based on ancient tradition of astronomy observations (This is in keeping with the scientific character of the theory of Omen by NOT allowing it to turn metaphysical, i.e. claiming paranormal abilities for Vyasa).

According to Nilesh Oak, the “theory of Omen has made significant contribution to our understanding of ancient history, by corroborating A-V observation not only per theory of ‘visual astronomy observations’ but also per the theory of ‘Omens’.”⁹⁹

⁹⁶Ibid. Page 53

⁹⁷Ibid. Page 67

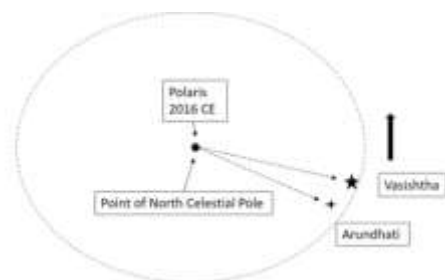
⁹⁸ “Response to Shri Shrikant Talageri – Part 8 of 8” <https://nileshoak.wordpress.com/2014/09/14/response-to-shri-shrikant-talageri-part-8/>

⁹⁹Ibid

Mystery of Arundhati explained.

The following are explained in his blogs and videos but not found in his book. He seems to have improvised his theory much after his book was released.

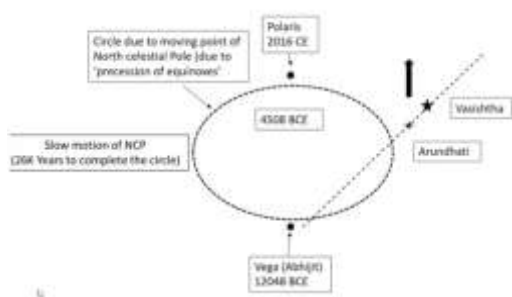
To prove that Arundhati did walk ahead of Vasishtha, he lays the (imaginary) circle inscribed by the precession of equinoxes. Every point in this circle signifies the location of Northern Celestial Pole star (NCP). He shows the relative position of Arundhati and Vasishtha with reference to this circle at the present time as follows:



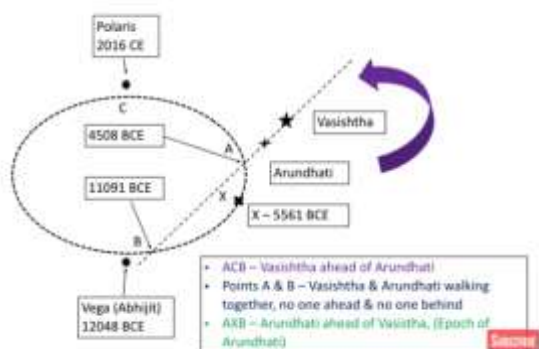
This position simulated in astronomy software shows Vasishtha moving in front of Arundhati. (Figure below)



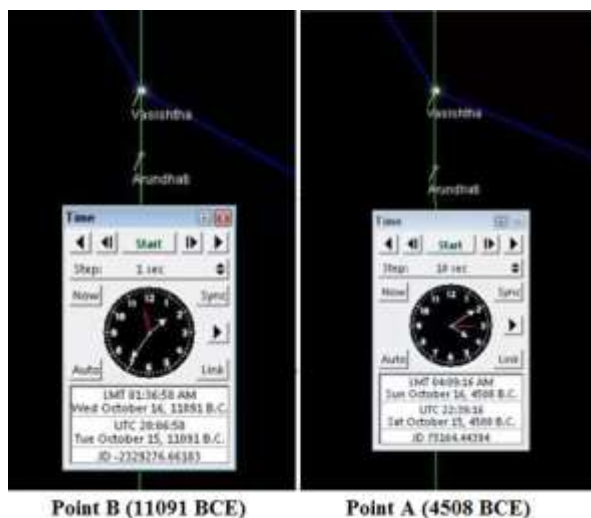
With the slow movement of precession of equinoxes the North Pole keeps moving in this circle. Then he draws a line connecting Vasishtha and Arundhati. This line intersects the circle at two points.



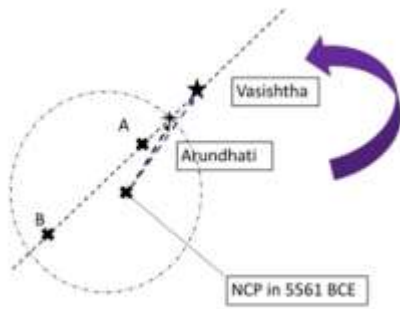
When he did the simulation in the astronomy software to check the two intersecting dates he found the dates corresponding to 4508 BCE at point A and 11091 BCE at point B. (Figure below)



When the NCP was along the circle between A and B, Arundhati was seen going ahead of Vasishtha. He calls the time period between A and B as “The Arundhati Epoch”. The simulation on the two points B and A (11091 BCE and 4508 BCE) showed Arundhati and Vasishtha were crossing the meridian together.



Then he picks up a point in the circle of NCP corresponding to 5561 BCE and joins it with Vasishtha and Arundhati. The motion of the star is in anti-clock wise direction as usual, but he noticed that Arundhati was going ahead of Vasishtha. (Figure below)

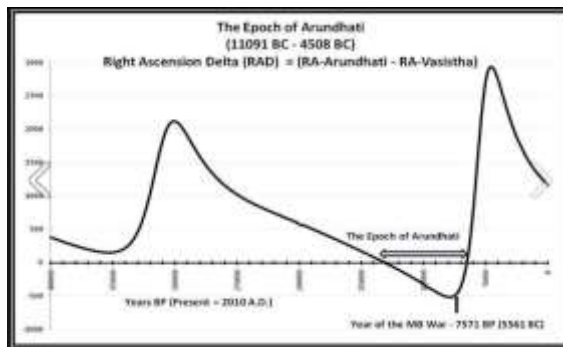


He simulated this date (5561 BCE) in the software and found that Arundhati was walking ahead of Vasishtha.



Since Arundhati was walking ahead of Vasishtha in the time interval that he calls as the Arundhati Epoch, one should look for the date of Mahabharata only in that period. In other words Mahabharata could not have happened any time after 4508 BCE. This is a clear rejection of traditional date of Mahabharata by over thousand years.

He describes this graphically by subtracting Right Ascension (RA) of Vasishtha from the RA of Arundhati. RA of Arundhati which was higher for many thousands of years showed lower value and became negative in the subtraction he did. The period of negative value was when she was walking ahead of Vasishtha. He depicted it graphically as follows:

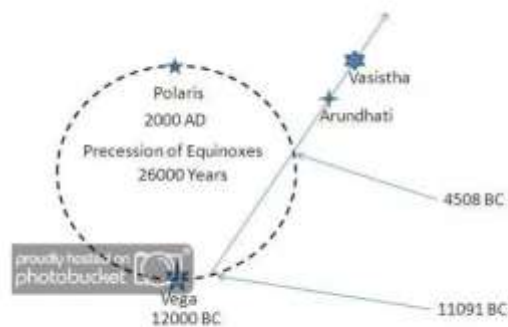


He calls the time span of the negative value, in other words, of LOWER RA OF ARUNDHATI COMPARED TO THE RA OF VASISHTHA AS THE EPOCH OF ARUNDHATI. It stretched for more than 6000 years between 11091 BCE and 4508 BCE. The astronomy reference of Vyasa on Arundhati walking ahead must have fallen in this period and thus it can be said that Mahabharata war occurred somewhere within this period. He picked out a specific year, 5661 BCE AS THE YEAR OF MAHABHARATA WAR by corroborating other astronomy references for that date in the Voyager simulations.

Causes for Arundhati walking ahead of Vasishtha

Now to the question why this reversal of the pair happened, he gives the following reason in his blog.¹⁰⁰

The phenomenon of Arundhati walking ahead of Vasistha was due to change in the position of the point of North Celestial pole as shown in the figure below

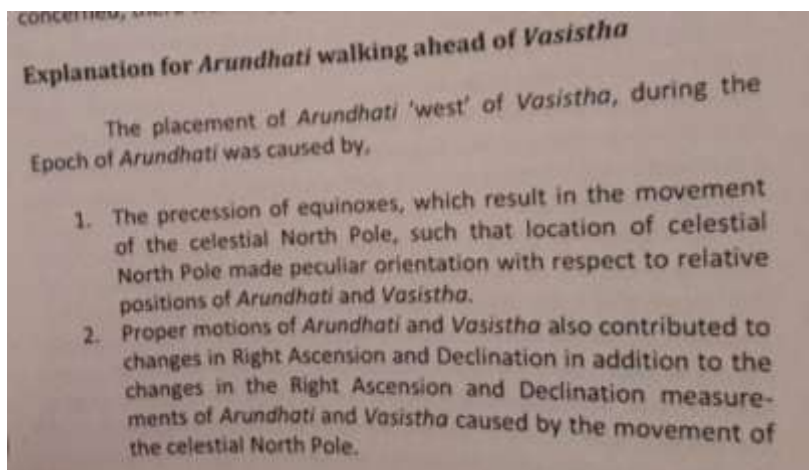


The point of North celestial pole was placed in such a way that Arundhati would have appeared to walk ahead of Vasistha anytime during 11091 BCE through 4508 BCE.

He deals with the same question in his book and says as follows:¹⁰¹

¹⁰⁰ <https://nileshoak.wordpress.com/2014/02/03/arundhati-vasistha-av-observation-of-mahabharata/>

¹⁰¹ "When Did The Mahabharata War Happen?" Page 67



He concludes his chapter on the Epoch of Arundhati as comparable in its importance,¹⁰²

“with discoveries of Copernicus (geocentric to heliocentric), Kepler (circular to elliptical orbits) or Galileo (celestial = terrestrial).”

Having stated all his views let me begin to analyse them in the upcoming chapters.

¹⁰²Ibid. Page 71

UTTARA PAKSHA

Chapter 3

EVALUATION OF ASSUMPTIONS OF NILESH OAK

After stating the problem to be solved (of ascertaining the date of Mahabharata war) Nilesh Nilkanth Oak begins his book with explaining the terms - assertion and assumption, before listing down 11 assertions and assumptions clubbed together. Nilesh oak says an **assertion** carries the burden of proof while an **assumption** doesn't. He places **presumption** in between these two and concedes that all these interpretations are his own assumptions!¹⁰³ *The reader gets baffled right from this chapter onwards* - from reading his interpretation of what an assumption is.

Mis-interpretation of the term 'assumption'

Nilesh Oak defines assumption as something that carries no burden of proof either by himself or by the reader, as it *"requires only the agreement of the respondent (or the reader in my case) and carries with it no burden of proof on either side."*¹⁰⁴ This definition of his seems to be straight out of **Cambridge Dictionary**. Only Cambridge Dictionary defines assumption as *"something you accept as true without question or proof"* and refers it to mean '**belief**'.¹⁰⁵ This explanation is for common usage of the word like WHEN X TELLS Y, "ASSUME THAT YOU ARE A KING". IT REQUIRES THE AGREEMENT BETWEEN THE TWO PERSONS, X AND Y. This assumption is only a supposition or imagination and not necessarily true and no proof is needed by X or Y to show that Y is a king. This is NOT THE WAY AN 'ASSUMPTION' IS TREATED IN A RESEARCH, but shockingly Nilesh Oak has proposed this definition of assumption.

Assumptions are vital for the success of a research. They are not made in ad-hoc ways but are derived after testing numerous times so that what is found out can be safely assumed to be true with no need to do any more experimentation or analysis. However *"...some assumptions might remain untested,"* says a publication of the **Berkeley University**,

"simply because all of our knowledge about the field suggests that the assumption is a safe one (e.g., we know of no reason why bacteria should multiply faster when their dishes are

¹⁰³ Ibid. Page 11

¹⁰⁴ Ibid. Page 11.

¹⁰⁵ <https://dictionary.cambridge.org/dictionary/english/assumption>

marked with a red, rather than a green, pen). All tests involve assumptions, but most of these are assumptions that can and have been verified separately.”¹⁰⁶

The importance of assumption is such that *an incorrect assumption cannot give correct results in a research, but a violated assumption can produce a false positive result*, says the Publication. So one must keep guard on violated assumptions or violation of assumptions to get a desired result.

Viewed from this backdrop, Nilesh Oak’s list of 11 assertions and assumptions appear to be a casual compilation, with no serious thought on what defines an assumption. As we go through his assumptions and assertions, and try to figure out how they are vital for the research we find them to belong to three categories, each with some incongruities.

1. Accuracy of simulations.

Nilesh Oak’s first assumption is about the accuracy of the astronomy simulations of the Voyager 4.5™. The astronomy simulations are “*assumed to be accurate and precise enough for the problem under consideration*,” writes Oak.¹⁰⁷ Any simulator will be designed to be accurate for the boundary conditions with which it is developed. Voyager 4.5™ is not the first simulator that Nilesh Oak has used. He has been using different simulators before he came up with the Epoch of Arundhati. HE HAS USED SKY GAZER™ IN THE PAST BUT COULD NOT GET ANY PALPABLE RESULT. WOULD HE THEN SAY THAT SKY GAZER™ WAS NOT ACCURATE? Would the makers of that software concede that their product would not give accurate results? They would never because that product can satisfy only certain outputs for which it is developed. Similarly the Voyager™ also did not show him the result he wanted to see.¹⁰⁸ Only 10 years after he began this search (not research) he could get the professional version of Voyager 4.5™ that was incorporated with ‘proper motion’ of stars.¹⁰⁹ Nilesh Oak’s claim of accuracy as an assumption is for this version only.

He re-simulated the Right Ascension Delta (RAD) in Voyager 4.5™ and discovered the ‘revolutionary objectively testable observation’¹¹⁰ of the Epoch of Arundhati in 2009. *A version that is supposed to be accurate for proper motion was found to help Nilesh Oak in getting accurate Right ascension data which was missing in earlier version of Voyager and Sky Gazer.*

¹⁰⁶https://undsci.berkeley.edu/article/howscienceworks_13

¹⁰⁷“When Did The Mahabharata War Happen?” Page 13.

¹⁰⁸“When Did The Mahabharata War Happen?” Page 62.

¹⁰⁹Ibid. Page 67

¹¹⁰“Balancing the effect” April 19, 2019,

Blogpost.<https://nileshoak.wordpress.com/2019/04/19/%E0%A4%95%E0%A4%BE%E0%A4%B0%E0%A5%8D%E0%A4%AF%E0%A5%8D%E0%A4%AF-%E0%A4%B8%E0%A4%AE-balancing-the-effect/>

WHAT IF A FUTURE VERSION OF VOYAGER OR ANY OTHER ASTRONOMY SOFTWARE GIVES A DIFFERENT RESULT?

Even the presently available ‘Proper Motion Simulator’ of the Gravity Simulator dot com¹¹¹ does not show Arundhati ahead of Vasishtha in Nilesch Oak’s Epoch of Arundhati. This simulator is exclusively working on proper motion of the stars given in the astronomy catalogues. So who will authenticate the accuracy of the simulations?

ACCURACY OF THE SIMULATOR CANNOT BE ASSUMPTION BUT IF IT IS SO, WHY DID IT SHOW VENUS NEAR PURVA BHADRAPADA, A SOLID 80° AWAY FROM THE SUN¹¹²

as highlighted in the Introduction earlier? If such discrepancy can happen with a planet in the solar system, how reliable are the locations of the stars Arundhati- Vasishtha lying 83 light years away from the sun?

At best it can be said that a *simulator is a technique to test the results already attained through conceptual, analytical and other means*. It cannot be a substitute to get results. Nor can it be made an assumption upon which a research can be done.

2. Faulty ideas of Nakshatra system of time reckoning.

Nilesch Oak’s 3rd assumption in that list is that the “Nakshatra system of time reckoning was well established at the time of Mahabharata war”.¹¹³ He again repeats this in the very beginning of the 4th chapter on ‘Mahabharata Astronomy’ that the “Mahabharata text describes a well-established *nakshatra* system”¹¹⁴. It is not known what he means by nakshatra system of time reckoning. It is not explained anywhere in the book except in the Table 3 on Nakshatras wherein he has given some numbers under headings, ‘Nirayan’ and ‘Sayan’ that were originally given by Vartak. In his explanation of this Table given in the Introduction he says that this Table “*provides basics of astronomy observations and their explanations.*” Clearly an average reader cannot make anything out of this, leave alone the knowledge of how the nakshatra system of Mahabharata kept track of the time keeping.

Nilesch Oak contradicts this idea of Sayan-Nirayan in chapter 10 in the context of Vartak’s views on the same, but not before handing an approval for the same. In his own words,¹¹⁵

“The reader who understands the rationale behind ‘the Epoch of Arundhati’ as the time interval of the Mahabharata war would certainly recognise the value of the theory of Sayan-Nirayan methodology during the time of Mahabharata war or even in further antiquity. On

¹¹¹ Proper Motion Simulator <http://orbitsimulator.com/gravitySimulatorCloud/properMotionHome.html>

¹¹²“When Did The Mahabharata War Happen?” Page 82.

¹¹³Ibid. Page 13.

¹¹⁴Ibid. Page 30.

¹¹⁵Ibid. Page 180.

the other hand, I assert that Sayan-Nirayan theory fails to corroborate Mahabharata observations it was expected to corroborate.”

There is very little that a reader is informed of how time is reckoned from the Nakshatra system. If we accept the definition of ‘assumption’ given by Nilesh Oak, clearly the respondent (the reader) is not in agreement with what the author conveys by the nakshatra system of time reckoning – the reason being, the reader has no idea of this system!

On the other hand Oak’s confusion about the system is in full display when he writes that

“For a star or an asterism to become a nakshatra, its position should be close at or close to the ecliptic, **in order to be useful for time reckoning.**”¹¹⁶(emphasis mine)

This statement is false as visual observation shows *that some stars are not at all close to the ecliptic*. **Swati** (Arcturus) is not close to the ecliptic and it was once a circumpolar star at Hastinapur latitude. Similarly **Moola** too lies very far away from the ecliptic. A regular visual observer of the moon knows how far away the moon goes from these stars. This can be observed in the simulator too. There are certain stars which seem to be too close to each other such as **Krittika – Rohini** and **Mrigashirsha – Arudra**. One cannot make out visually in which of these stars the Moon is transiting without keeping a daily track of the movement of the moon or without referring to an almanac.

With no clear concept on how the nakshatra system of tracking time works, he makes the reader a respondent in accepting this as an assumption without proof! With both the writer and the reader not sure about what this concept is about, how does this system fit in with the definition of assumption that Nilesh Oak has given?

3. Reliability of the Mahabharata text.

Apart from the two ‘assertions and assumptions’ discussed above, the remaining 9 are about Mahabharata text in some way or the other.

- The 2nd assumption asserts that **Mahabharata is a factual** event. As an Itihāsa it is factual, but as one calling for logical acumen, Nilesh Oak cannot make this an assumption for, this (that Mahabharata is a factual event) must be *the outcome of his research*. By successfully corroborating the astronomy events, one has to prove Mahabharata to be factual.

¹¹⁶Ibid. Page 50.

- The 4th assumption speaks about three recensions, by Vyasa, Vaisampayana and Sauti. But in the 9th assumption he proposes the idea of multiple recensions by multiple authors. In the 7th assumption he says that death of Krishna and Pandavas were additions in latter additions. WHAT DOES HE CONVEY BY THESE – THE TEXT IS RELIABLE OR NOT RELIABLE?
 - Having assumed or asserted that Mahabharata is factual, Nilesh Oak writes in the 11th assumption that *errors are there, due to transmission* over time. DOESN'T THIS AMOUNT TO MAKING MUTUALLY CONTRADICTORY ASSERTIONS? How can contradictory ideas be part of assumptions?
 - None of what he had said in 4th (many recensions), 9th (multiple authors for current Mahabharata) and 11th assumption (transmission errors and interpolations) are going to affect the astronomy dating research. Had he told that the astronomy references differ between recensions, and then there is need to solve them and take the resolved one as an assumption. *If on the other hand there are contradictions within the stated references (astronomy or otherwise) in the text, they must be resolved objectively*, before taking them for testing. Those that cannot be resolved cannot be used as valid references.
 - The glaring example is his use of KRISHNA'S REFERENCE TO 56 DAYS AS THE DAYS LEFT FOR BHISHMA NIRVANA AND COUNTING IT UP TO DERIVE 98 DAYS AS THE DURATION BHISHMA WAS LYING ON ARROW BED. This contradicts Bhishma's own version that he was in the arrow bed for 58 nights. As per his 2nd assumption that Mahabharata is factual, both 58 and 56 must be true. When 2 versions are found within the text for the same event – that is deeply relevant for dating the event, the contradiction must be first resolved using the tools and concepts of Mahabharata times. *Why didn't Nilesh Oak resolve this before using it straightaway to give an inflated period of Bhishma's stay in arrow bed?*
 - The remaining three assumptions carry no value either as an assumption or an assertion. The 5th assumption that Mahabharata is the story of Kuru dynasty with other stories within, the 8th assumption that Vyasa wrote Mahabharata to preserve history of Kuru dynasty and the 10th assumption that Vyasa wrote the book in a cave in Himalaya make *no relevance as assumptions and no utility as assertions* except that Oak was found to use the 8th assumption to propose one of his theses.
- In the final analysis, one cannot help wondering why he included a section for assumptions and assertions when he absolutely had no idea of the role assumptions

play in a research. Perhaps he was guided by the norm that a research must have assumptions and hence had this section!

Contradictory theses.

After giving the assumptions and assertions Nilesch Oak states his Theory¹¹⁷ as consisting of three theses. Of these **the first two contradict with each other**. First thesis states **that all astronomy observations** in Mahabharata are ‘visual observations’ of the sky. Any reader would take this to mean seeing the object with the naked eye because visual means seeing or capable of being seen. But his next thesis states that Mahabharata **people used some means to observe the objects which could not be seen by the naked eye**. This contradicts the first one.

If they had used devices to see the objects of the sky, Oak cannot be right in saying that ‘all’ astronomy observations were visual. If by ‘visual’ he refers to both naked eye and aided observation of the sky, *he has to prove that such aids were used* in Mahabharata times.

Though a thesis is just a hypothesis to be proved in the research, he has not shown in his book any evidences from Mahabharata verses to establish that the people of that time indeed used some devices to see the sky objects. Where he can see a configuration (mentioned in Mahabharata) detectable in Voyager simulation he calls it visual. For example in his experiment 17 on the Sun and the Moon together afflicting Rohini, he could see the two luminaries setting and Rohini rising in the simulation. He asserts ‘*this observation to be a visual observation of the sky*’ corroborating the affliction mentioned in the text¹¹⁸

On the other hand when he could not find a ‘tikshna’ or ‘tivra’ planet near Kritika but sees **Pluto** near that star – *a recently discovered body which the scientific community is yet to approve as a planet* - he has NO HESITATION TO RECORD THIS AS A CORROBORATION OF THE VERSE. He however concedes that “*This observation demands telescopic ability, i.e. access to such instruments in Mahabharata times*” but does not care to establish that such instruments were in use at that time. His aim is to somehow show that he is able to corroborate. He just says, “*This ability (telescopic ability) is also required to explain few other Mahabharata observations.*”¹¹⁹

Even this statement of his is not true, for, in this particular context of establishing a tivra planet near Kritika, his task was “SIMPLY TO RE-CONFIRM WHAT VARTAK HAS ALREADY

¹¹⁷“When Did The Mahabharata War Happen?” Page 14 & 15.

¹¹⁸ Ibid. Page 84.

¹¹⁹Ibid. Page 83.

FIGURED OUT.¹²⁰ Can this be taken to mean that he is merely corroborating the astronomy observations of “**VARTAK MAHABHARATA**” and **NOT VYASA MAHABHARATA**? Unfortunately he forgot to add Vartak Mahabharata in the assumption list thereby denying scope for a question like this.

Even if it be said that his second thesis is proven right by the conjectural evidences as shown above in the case of Kritika star, all these evidences requiring devices for seeing a sky object are about invisible planets such as **Uranus, Neptune and Pluto**. These are not at all part of any literature in Vedic society and not even part of Hindu astronomy until now. Therefore he has to first prove that these three planets were known to the people of Mahabharata times before going on to ‘corroborate’ them through simulations.

Purpose of astronomy references.

His 3rd thesis that astronomy observations made during and around the time of Mahabharata were aimed **at creating records of the timing of war** is also not substantiated by any verse of Mahabharata. Even the talk on Arundhati observation was not given by Vyasa to create records but only to caution Dhritarashtra about the coming of the bad times for his sons. Vyasa begins the talk by cautioning him not to grieve and ends the talk by highlighting the power of Time. The purpose of his visit and his talk is well made out before he left, in his appeal to Dhritarashtra to restrain his sons, teach his sons the right path and avoid slaughter. ALL TALK ON ASTRONOMY EVENTS WAS TO IMPRESS UPON THE KING OF THE BAD TIMES INDICATED BY THEM SO THAT THE KING WOULD BE CONVINCED TO STOP THE WAR AND GIVE PANDAVAS THEIR KINGDOM.¹²¹

What Vyasa had done is what anyone having the knowledge of the past, present and future is expected to do. The 2nd chapter of Brihat Samhita quotes the words of sage **Garga** – a sage of Mahabharata times – that a king will be ruined if he does not support a Jyothishaka – a knower of all three Times. Though not identified as an astrologer, Vyasa is introduced in that context as one having knowledge of future or what is going to come.¹²² He is Dharma-bound to caution the king of the repercussions based on what he sees as the indicators of the bad times.

¹²⁰Ibid. Page 83.

¹²¹Mahabharata. 6-4-9

¹²²Mahabharata. 6-2-1&2

This feature is repeated in Brihat Samhita *in the event of sighting omens*¹²³ and in *advising the king when an evil is indicated*.¹²⁴ That none other than Vyasa has been known for giving omens to those in political power is made out from another verse of Brihat Samhita that speaks about omens connected with the statue of Vyasa!¹²⁵ In Tamil literature too we come across reference to a **Group of Big Five** that includes minister, astrologer, chief commander, emissary and Intelligence officer¹²⁶ who would always accompany the king and help him make decisions then and there. If Nilesh Oak thinks that the astronomy references were made for creating records, he had not proved it in his book. On the contrary the above evidences show that an all knowing person or an astrologer is expected to fore-warn the king.

After stating these theses, Nilesh Oak devotes a full chapter on Astronomy basics to explain basic terms such as equinox, circumpolar star, sidereal period, synodic period etc. The **passage on Circumpolar stars** found in his book¹²⁷ is found to be a *reproduction of the first paragraph of the Wikipedia article for 'circumpolar'*.¹²⁸ Nilesh Oak doesn't give the reason why a star becomes circumpolar. The reason appears in the second paragraph of the Wiki article, but without that Nilesh Oak's reproduction appears incoherent. Similarly his version on 'sidereal and synodic month' raises doubts about his understanding of those terms. The most important concept of equinox and solstice is thoroughly misunderstood by him. That will be discussed after exposing his flawed views on Mahabharata Astronomy.

¹²³Brihat Samhita, Ch. 46- 17

¹²⁴ Brihat Samhita, Ch. 48-3

¹²⁵Brihat Samhita, Ch. 46-12

¹²⁶Silappadhikaram. Ch 26 –line 38

¹²⁷“When Did The Mahabharata War Happen?” page 22.

¹²⁸Circumpolar star https://en.wikipedia.org/wiki/Circumpolar_star

Chapter 4

FLAWED VIEWS ON MAHABHARATA ASTRONOMY

In his chapter on Mahabharata Astronomy, Nilesh Oak briefly describes 19 ideas of which those with faulty interpretations or lack of understanding are discussed in this chapter.

Mahabharata calendar.

All that has been discussed under “Mahabharata Astronomy” by Nilesh Oak are about the different features of the Mahabharata calendar. Oak was almost right in identifying the *5-year Yuga system as the calendar of Mahabharata* times but went wrong on most features by giving incorrect meanings and interpretations. He almost came close to identifying the specific verses of Mahabharata that give a clear idea of the kind of calendar in use, when he referred to the confusion of Duryodhana “*regarding the total duration spent by the Pandavas in exile.*”¹²⁹ But that discussion was unfortunately limited to the “choice of lunar vs solar year”.

When Duryodhana and Drona thought that the Pandavas revealed themselves before the end of the exile period, Bhishma refuted them by explaining that two extra months are formed every five years. In thirteen years, five months and twelve nights are in excess since they left.¹³⁰ So the few days of shortage are more than compensated by the excess of months accrued over 13 years of exile. The exact verse uttered by Bhishma gives all the features of the 5-year Yuga cycle delineated in Rig and Yajur Vedanga Jyotisha. It would have done well for his research had he taken the astronomy of Rig and Yajur Vedanga Jyotisha as assumptions.

Mahabharata calendar was the 5-year Yuga calendar that included **Nakshatra** and **tithi**. We find another element of time namely **Karana**, in Mahabharata. A Karana is half of a tithi (Karana is 6 degree duration, while a tithi is 12 degree duration). There is a reference to one of the Karanas in Mahabharata. In the meeting with Krishna, Karna narrates a series of nimittas in which he mentions the location of a **karana at the star Citra**. He refers to “citrām pīḍayate garahah”¹³¹

¹²⁹“When did the Mahabharata war happen?”Page 31.

¹³⁰Mahabharata. 4-47-3

¹³¹Ibid. 5-141-9

The ‘**Gara**’ in this verse is interpreted by many as Graha, a planet. This is Gara Karana. It was associated with star Citra on a particular day against the normal course of time. This was noticed by Karna.

The Mahabharata calendar is thus seen with all the five features of the traditional almanacs of today-Vāra (solar day), tithi, nakshatra, karana and yoga – the last one though not mentioned explicitly in Mahabharata is an integral element of the 5 year Yuga system. Yoga is a total distance covered by both the Sun and the Moon in a day while tithi is the reverse of yoga. It is the difference in distance between the Sun and the Moon in a day.

If Nilesch Oak had shown equal interest to know the traditional terms and concepts of astrology in the same breath he learned the western astronomy terms by procuring astronomy catalogues, he would have avoided many incorrect statements in his book. Not only statements, even incorrect concepts could have been avoided.

Funny concept of “Insertion” of Adhika Masa.

Nilesch Oak does not seem to have the basic idea of how the lunar year is adjusted to make it align with the solar year every two and a half years. The 2nd reference in his list of Mahabharata references addresses this issue of how two months get increased due to the spinning of the luminaries with one of them spinning with delayed speed.¹³² Despite the clear explanation by Bhishma in the verses referenced in his book, Nilesch Oak is always found to refer to *“insertion” of an Adhika masa*. He thinks that a lunar month is added periodically,¹³³ while the fact remains that it is expunged! Time goes intact, only we choose to ignore certain months and call such months as Adhika masa.

His confused understanding of Adhika Masa is once again revealed when he tried to locate winter solstice coinciding with ‘*Magha Shuddha Ashtami*’ – the start of Uttarayana when Bhishma shed his mortal coil. As usual he ran the Voyager simulator to find out the time interval between the two and pick out a median value – which by itself is unscientific in a research aimed at fixing the accurate date of an historical event. And now comes an unbelievable explanation that

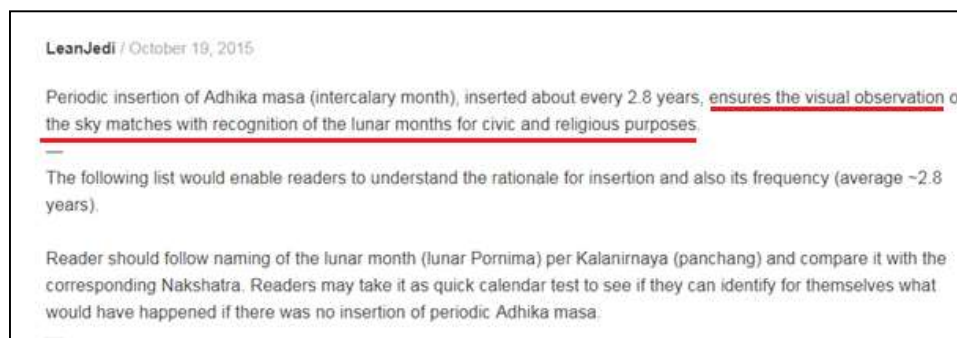
¹³²Mahabharata: 2- 4 <http://www.sacred-texts.com/hin/mbs/mbs04047.htm>
evam kālaviḥāgena kālacakram pravartate

3 teṣāṃ **kālātirekeṇa jyotiṣāṃ** ca vyatikramāt
pañcame pañcame varṣe dvau māsāv upajāyataḥ

¹³³“When Did The Mahabharata War Happen?” Page 46

“The actual time interval would stretch for at least 2000 years, and IF ONE ADDS THE SPICE OF ‘ADHIKA MASA’ (extra lunar month inserted periodically to align lunar and solar calendars), the time interval would stretch up to 3000 – 4000 years.”¹³⁴

HE THINKS THAT ADHIKA MASA FOR THE 2000 YEAR DURATION WILL BE CALCULATED AND ADDED TO THE TIME INTERVAL HE IS SEEING IN THE SIMULATOR! When I searched through his blog to know whether he really thinks that an adhika masa is added, I was astounded on reading this response by him.¹³⁵



(Lean Jedi is Nilesh Oak’s pen-name for his blog)

In this blog entry, Nilesh Oak is giving us additional information on adhika masa that **BY INSERTING THE ADHIKA MASA, THE VISUAL OBSERVATION OF THE SKY MATCHES WITH THE RECOGNITION OF THE (ADJUSTED) LUNAR MONTHS!** This gives an impression that Adhika masa is added much like an extra day in February in the leap year in the Gregorian calendar. This also shows that Nilesh Nilkanth Oak does not know how the adhika masa is computed and why it is expunged (not inserted).

Why Adhika masa is calculated?

Adhika masa is the basis for the 5-year Yuga system of the Mahabharata period. It continues to be valid today even though the 5-year Yuga system is no longer in vogue. It is based on the astronomy fact that the sun and the moon crossing the same point in space in the back drop of a particular star cross the same point simultaneously only after 5 years. But by that time, the sun makes 5 revolutions (5 solar years) around the zodiac while the moon makes 5 revolutions (5 lunar years) plus 2 months.

Sun in 5 years = 12 months x 5 = 60 months

Moon in 5 years = 12 months x 5 = 60 months + 2 months = 62 months

¹³⁴“When Did The Mahabharata War Happen?” Page 138

¹³⁵<https://nileshoak.wordpress.com/2015/10/19/adhika-masa-visual-observations-of-the-sky/>

The reason for this is the difference in the speed of the sun and the moon. The sun takes 365.25 days to complete one round with reference to a star (sidereal year), which is covered by the moon in 354 days. The difference between these two is 11.25 days and this is accumulated to the extent of 28.125 days for every two and a half years and 56.30 days in 5 years.

As a thumb rule, this can be re-phrased that *the moon goes faster by 1 day every month*. In 12 solar months (= 1 solar year) it completes 12 extra lunar days. It becomes 24 lunar days in 2 solar years and 30 lunar days (= 1 lunar month) in two and a half solar years. Since the accumulated days had reached 1 month duration, it is considered as Adhika masa and not counted in the lunar year. Since it is not counted as a month, no auspicious and religious activities are done in that month.

This record keeping can never be tampered with. What Nilesh Oak sees in the simulator is the span of the sky covered by both the sun and the moon in different speeds as explained above. *The simulators made by westerners show the record of solar years* (in Gregorian or Julian calendar). But within the duration of each solar year, the moon completes 1 lunar year plus 11.25 days. So **there is no way to say that the adhika masa is ‘inserted’ to match with the visual observation of the sky.** There is no way to add adhika masa in the years picked out in the simulator. What one can do is to calculate the adhika masa within the time interval and expunge them. But this is not a scientific way to arrive at the precise month of the adhika masa.

This issue does not arise if one is following only the solar months. Nilesh Oak’s idea that visual observation does not match unless an Adhika masa is inserted only reveals his lack of knowledge of how the system works in traditional time-keeping which is being followed even today.

Oak clueless on year- beginning in Mahabharata times.

In his 4th chapter on Mahabharata Astronomy Nilesh Oak says that Mahabharata “*is not explicit regarding the beginning of the year.*”¹³⁶ But Mahabharata gives a major clue on when the year started, from Bhishma’s justification of the exile period on the basis of the 5 year Yuga system. As a Mahabharata researcher who is aware of the fact that the 5-year Yuga system was in vogue, Nilesh Oak must have immediately reached out to Vedanga Jyothisha texts that describe all about the 5-year Yuga system. In the 5-year Yuga system, Uttarayana is the

¹³⁶“When Did The Mahabharata War Happen?” page 31

beginning of the Yuga coinciding with the beginning of the first year.¹³⁷ Unfortunately nowhere in his book does one come across any evidence of Oak's acquaintance with subjects of background knowledge of traditional terms and concepts. His was a *complete dependence on Voyager simulator*.

Rig and Yajur Vedanga Jyotisha texts are the sources for deducing the year and the Yuga system of Mahabharata. Yajur Jyotisha does not mince word in saying what forms a year. It is the sun whose movement is the basis of the year.¹³⁸ The year, the unit of the 5- year Yuga started at Uttarayana (winter solstice).¹³⁹

Astronomy observations not always visual.

The 5- year Yuga system is such that the visual observations were always complemented by **mathematical calculations (Gaṇita)**. When asked by Drona about the duration of exile covered by the Pandavas, *Bhishma did not look up at the sky*. He did a calculation for all the 13 years and arrived at the extra months and the days spent by them in exile (to be shown in chapter 12)

The 5-year Yuga system as explained in Rig Vedanga Jyotisha shows that the number of sun-risings, moon-risings and star-risings for a five year period were noted down in a remote past and based on that the time-distance factor for each was calculated. The solar, synodic and sidereal days are expressed in relation to each other. The various references in the Mahabharata to the location of the sun or the moon in an asterism or a star must be seen in this backdrop and not as visual observations.

The location of the luminaries was not deduced by looking at the sky as claimed by Nilesh Oak. The 5-year Yuga system shows that the position of the sun and the moon on any day of the 5 year period was done by mathematical calculations. This system is proof of an advanced knowledge of space and time in which $124 \times 10^{-1/20}$ parts¹⁴⁰ make one **Nādika** that is equal to 24 minutes in present-day time units. And two nādikas make one **Muhurtha**. Bhishma's reference¹⁴¹ to Muhurta as part of the time scale while justifying the completion of the exile period of the Pandavas must have alerted Nilesh Oak to the need to look into the traditional wisdom on Muhurtha.

¹³⁷Rig Jyotisha 8 & 9, Yajusha Jyotisha 9 & 10.

¹³⁸Yajur Vedanga Jyotisha - 28

¹³⁹ Rig Jyotisha:5, Yajur jyotisha: 6

¹⁴⁰ 5 gurvashatas or 10 mātrās = 1 Kāshthā; 124 Kāshthā = 1 Kalā; $10^{-1/20}$ Kalā = 1 Nādika. Rig Vedanga Jyotisha 16, Yajur Vedanga Jyotisha 12, 30, 38, 39.

¹⁴¹Mahabharata: 4-47-1 <http://www.sacred-texts.com/hin/mbs/mbs04047.htm>

Fundamental concept of Muhurtha not understood.

Muhurtha¹⁴² is a basic unit of time which continues to be vigorously followed even today. A solar day has 30 Muhurthas that is split into day-time and night time Muhurthas of 15 each. The nature of each Muhurtha (nature of time) is revealed by the etymology of the name of the Muhurtha. That this has been *perfected in Mahabharata times is known from the verse on Krishna starting off for the peace talk in Maitri Muhurtha where Maitri means friendship*. As a Mahabharata researcher Nilesh Oak is expected to do his homework on terms such as this pertaining to Mahabharata astronomy. But from what he says it is obvious that he has not acquainted himself with the fundamentals of Mahabharata astronomy. HE THINKS BY POSSESSING VOYAGER SOFTWARE AND LEARNING TO RUN IT – WHICH ANY KID CAN DO- HE CAN DECIPHER THE ASTRONOMY TERMS OF MAHABHARATA AND FIX UP THE DATE OF MAHABHARATA WAR based on it.

Nilesh Oak says,¹⁴³

“Krishna left Upaplavya, early morning, on 31st August... I do not know the significance of ‘Maitri Muhurta’, however if it refers to ‘Maitri’ nakshatra being on the eastern horizon, then Anuradha (Maitri) nakshatra was on the eastern horizon around 7:30 AM.”

His honesty in accepting that he doesn’t know the significance of the term cannot be appreciated in a research. **What should a genuine researcher do when confronted with terms unknown to him?** He/she must first develop a data base of all the unknown terms in the text and gather information about them. This must be done before embarking on the research. But Nilesh Oak is someone who thinks that scientific methodology means using only the software and does not realise that *“history is a science in the method and manner in which it studies the evidence and ascertains the facts.”*¹⁴⁴ By his failure to approach the issue in a scientific manner of collecting information on fundamental concepts (there are many), he is giving wrong information that Krishna started off “early morning” and makes a ridiculous derivation of time from the Voyager by bungling up *Maitri Muhurtha with Anuradha nakshatra*.

Oak’s revolutionary discovery of the meaning of ‘Vakri’ motion

‘Vakri’ is a word that often troubles this Mahabharata researcher. Since HE NEVER THOUGHT THAT LEARNING ASTROLOGY TERMS WOULD HELP IN UNDERSTANDING THE ASTRONOMY TERMS OF MAHABHARATA, we are entertained with a new a discovery of the definition of

¹⁴²One Muhurta = 48 minutes.

¹⁴³“When Did The Mahabharata War Happen?” Page 116

¹⁴⁴Sreedharan, (2007) “A Manual of Historical Research Methodology” South Indian Studies. Page 23

Vakri, through ‘Voyager- Simulation Nyaya’. He gives the list of findings on Vakri he made through this Nyaya in the 4th chapter on Mahabharata astronomy¹⁴⁵, of which his discovery that ‘*all planets appear much brighter than their usual magnitude during their retrograde motion*’ is the first of its kind that no scientist had ever proposed or dared to propose.

Vakri is generally translated as ‘retrograde motion. But OAK FOUND A DIFFERENCE BETWEEN VAKRI AND RETROGRESSION THROUGH THE VOYAGER- SIMULATION NYAYA AND PROPOSES THAT THE MAHABHARATA USES THE TWO TERMS IN DIFFERENT MEANINGS. After working on the vakri of different planets with the aid of this Nyaya, he came to the conclusion that

“Mahabharata astronomers referred to oblique crossing of the ecliptic by a planet as ‘vakri’ motion while the true retrograde motion of a planet was described as being steady (dhruva or sthayi), or travelling in reverse (apasavya) direction.”¹⁴⁶

For a reader confused with this distinction between vakri and retrograde motion, a solution is available in his blog as follows: ¹⁴⁷

Explanation – When Mahabharata text refers to ‘Vakri’ motion of planets, it is referring to ‘oblique’ motion of planets across the ecliptic and not the ‘retrograde’ motion of planets.

Prediction – Since Jupiter is described as going ‘Vakri’ near nakshatra Shravana, one should observe Jupiter traveling obliquely across the ecliptic near nakshatra Shravana around the time of 5561 BCE

Testing – Jupiter does travel obliquely across the ecliptic near nakshatra Sharvana, around 5561 BCE.

Anticipating what the reader would ask on reading this, he continues to write as follows in the same blog post.

Of course, one should also ask the obvious question...

If ‘Vakri’ means oblique motion across the ecliptic, how did Mahabharata text describe the ‘retrograde’ motions of planets?

This would then become the next interesting problem to solve, a problem of higher complexity, due to groundbreaking work on the ‘Vakri’ motions of Mars and Jupiter (as described in the Mahabharata text)

Whether one ever solves this next problem or not, one must recognize that with above research (using Tri-Murti formula) a progress has been made and our knowledge of Mahabharata astronomy has grown.

He differentiates the two movements – Vakri and retrograde - of which the definition of the latter continues to elude him. As one who has confessed in the very beginning of his book

¹⁴⁵“When Did The Mahabharata War Happen?” Page 37

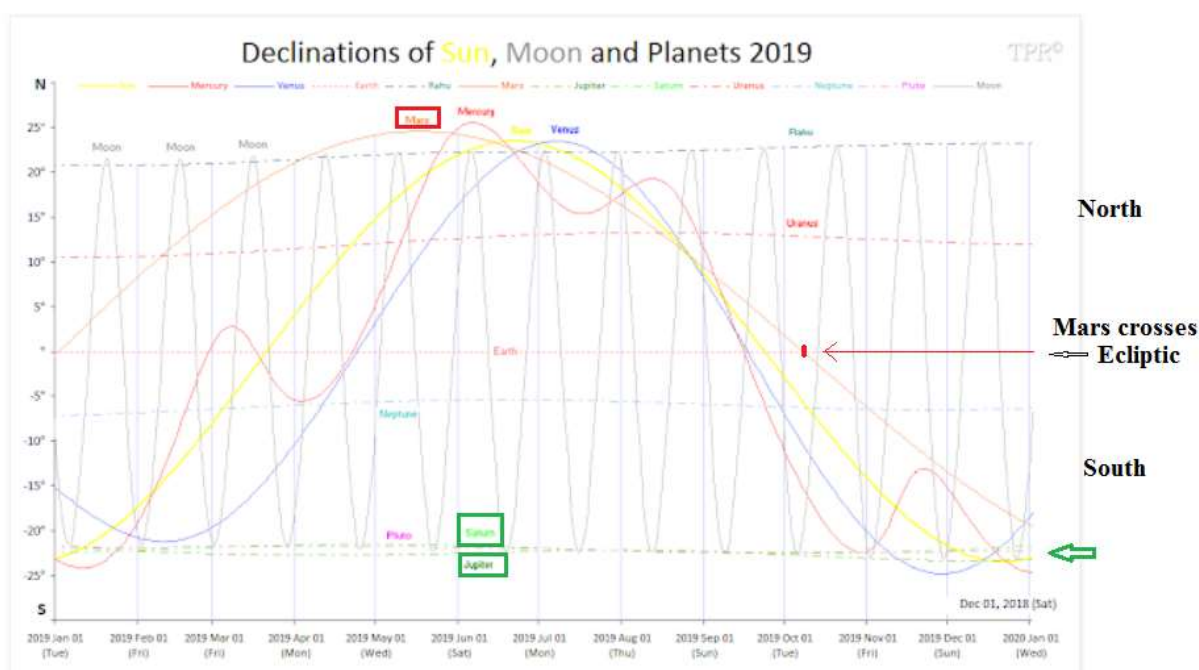
¹⁴⁶ Ibid. Page 81

¹⁴⁷“Tri-Murti of scientific Method” <https://nileshoak.wordpress.com/2014/10/07/tri-murti-of-scientific-method/>

that HIS APPROACH IS 'PIECEMEAL'¹⁴⁸ he has solved the problem of Vakri for now and postponed to a future research the concept of 'retrograde motion' given in Mahabharata.

With this piecemeal discovery Nilesh Oak goes on to locate the vakri planet and the retrograde planet in the simulator and claims victory that he had correctly found out the date of that observation.

If his definition of vakri is true, then Mars cannot be seen making oblique crossing of the ecliptic this year –i.e. 2019 – the year of writing this critique, for the simple reason that Mars does not have vakri motion, or retrograde motion throughout 2019. But what does the declination graph for 2019 show? It shows Mars crossing the ecliptic from north to south in mid-October 2019. Similarly the outer planets such as Jupiter and Saturn are in vakri motion in the middle of the year, but both are seen at the southernmost part of the ecliptic throughout the year with no obliquity in their motion. The following graph testifies this.¹⁴⁹



Mars is marked within red box while Jupiter and Saturn are marked inside green in the above graph. A no-vakri Mars is crossing the ecliptic obliquely while there is no change in the path of Saturn and Jupiter that are in vakri motion in the middle part of the year.

A simple cross-checking of the current motion of these planets offers the best test of his hypothesis on vakri motion, but he has omitted this important step. Even before we could plunge into his Epoch of Arundhati and planetary alignments in support of his date, WE ARE FINDING HIM MAKE

¹⁴⁸“When did the Mahabharata war happen?” Page 5

¹⁴⁹Source: <http://time-price-research-astrofin.blogspot.com/2018/12/declinations-of-sun-moon-and-planets.html>

HIMALAYAN BLUNDERS IN UNDERSTANDING THE TERMS OF MAHABHARATA ASTRONOMY. One can then imagine the veracity of the findings coming out of this flawed use of the term vakri to locating a date in his simulator.

1. What is Vakri motion?

So what is the real story? Does Mahabharata differentiate between Vakri and retrograde motion (Dhruva and apasavya)? The true import of these terms can be understood if we know what vakri is.

Vakri motion continues to be part of astrology and it is the same as what the author of Mahabharata had meant. It plays a vital role in astro- meteorology too besides being an indicator of terrestrial events. When the inner planets namely Venus and Mercury begin or end vakri motion, rainfall is anticipated. There are a few days of ‘stillness’ – or no motion called ‘**Stambhita**’ (fixed) just before and after vakri motion starts. By turning a Nelson’s eye to the original meaning of the words of this subject due to his aversion to Jyothisha, **Nilesh Oak cuts a sorry figure in his interpretation of this and other astronomy terms of the Epic.**

Vakri motion is geo centric, that is, it is the motion of the planets, both inner (called inferior planets) and outer (called superior planets), as seen from the earth. In the case of inferior planets when they come in between the sun and the earth they seem to go on the reverse for an earth-bound observer. Figure 4 depicts vakri or retrograde motion of Venus, an inferior planet. This holds good for Mercury also.

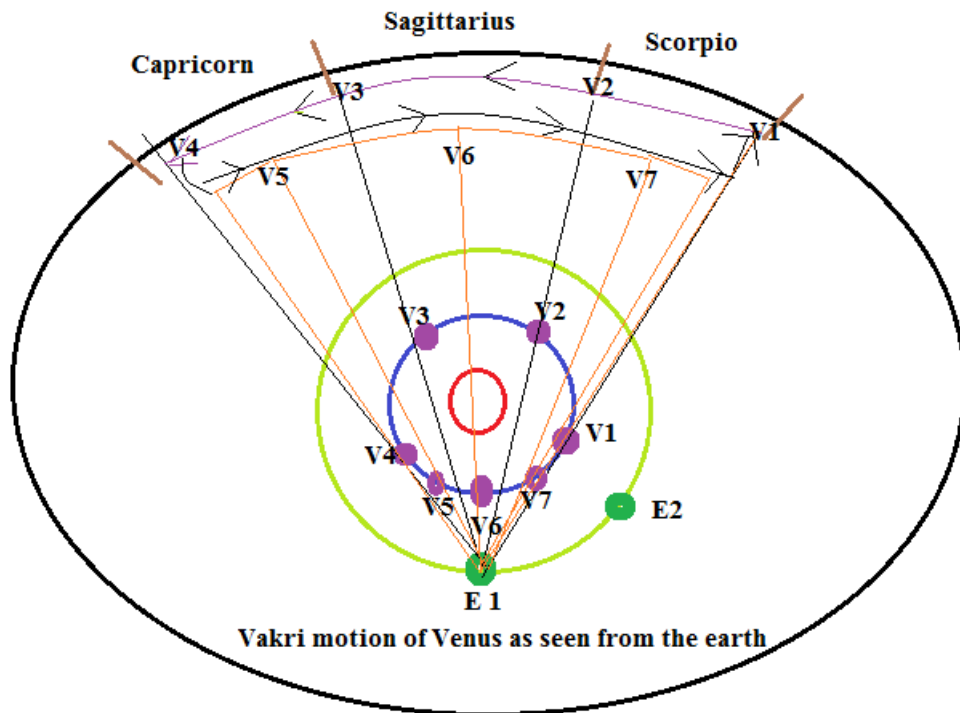


Figure 4: Vakri motion of Venus (inner planet)

In Fig 4, E1 is earth (observer) and V1, V2, V3, V4, V5, V6 and V7 are different positions of Venus as it moves around the sun. The lines connecting E1 and V1 to V7 must be observed to see how the location of Venus is seen from the earth. The top curve starting from V1 to V4 near the zodiacal signs shows the path of Venus as seen from the earth when it moves from V1 to V4. That is when it is on the other side of the sun (as seen from the earth). Once it comes in between the earth and the sun its positions will appear at V5, V6 and V7. The extended lines from the observer (E1) to V5 to V7 will show that Venus would seem to go in reverse direction. Once Venus reaches V1 position it would once again would appear to go in forward motion.

In the turning around region the planet would appear as though it is not making any movement for it will take some time to see its motion. This state lasts for just 2 days in the case of Venus. This state is known as **Stambhita** or **dhruva** position of the planet. If one notices a planet not moving (Dhruva or Stambhita), it means either one of the two – going to start retrogression or come back to forward motion.

The same kind motion is seen from the earth for superior planets also. In their case, when the earth is in-between the sun and those planets, they would appear to regress. It is like overtaking a car coming in outer lanes while turning around a corner. The car in the inner lane would finish the turning faster while others in outer lane would seem to go behind. The

same rationale is applied to outer planets that cover a larger orbit of curvature. Vakri motion of Mars as seen from the earth is shown in Figure 5.

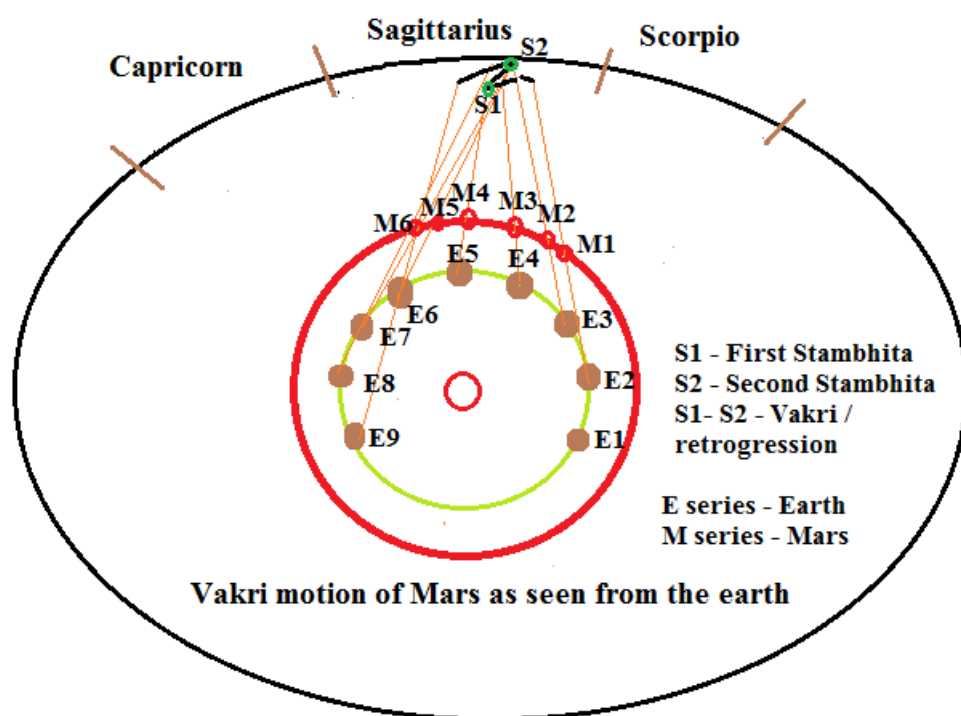


Figure 5: Vakri motion of Mars (outer planet)

E1 to E9 are positions of the earth. M1 to M6 are the positions of Mars. S1- S2 is the vakri or retrograde phase of Mars where S1 and S2 are the locations of Stambhita.

The vakri days are constant for the respective planets for the very reason that the motion-based time period is calculated on the basis of relative speed of the planet and the earth. For an inferior and fast moving planet like Venus the entire vakri period is 42 days (including 2 +2 days of Stambhita) while it is 80 days (including 3+3 days of Stambhita) for Mars. But what does Oak say? He says,¹⁵⁰

“As simulation progressed, Mars began crossing the ecliptic and was clearly on the other side (north) of the ecliptic when it reached Magha, it travelled straight passing Chitra on its way to the region of Swati when it turned back and approached Chitra for the second time, and after spending ~ 6 months in the region of Chitra / Swati, travelled east. Mars began crossing the ecliptic again was on the other side (south) of the ecliptic near Anuradha, travelled towards Jyeshtha and then straight to Shravana and settled along the Brahmarshi (Abhijit) by the first day of War.”

¹⁵⁰“When did the Mahabharata war happen?” Page 81.

He has applied his theories of ‘obliquity’ and crossing the ecliptic for the vakri motion of Mars and found it to reach Swati and then turn back to Chitra and spend 6 months in the region of Chitra and Swati. CAN THERE BE ANYTHING MORE UNSCIENTIFIC THAN SAYING THAT MARS IN VAKRI MOTION SPENT 180 DAYS (6 MONTHS) AT A LOCATION WHILE IT CANNOT EXCEED 80 DAYS IN VAKRI MOTION? But Oak wants us to believe that he has ‘discovered’ the meaning of ‘Vakri’ from this simulation. He says, ¹⁵¹

“I felt confident that I had truly discovered the meaning of ‘vakri’ as intended by the Mahabharata author”.

He repeats the same stuff in April 2019 in his blog as follows:¹⁵²

Nyaya Sutra 5:1:27

कारणान्तरादपि तद्धर्मोपपत्तेरप्रतिषेधः

(This is no opposition because that character can be ascertained by other means as well)

The argument, namely, that **AV observation** is **useful** because it is an **objectively testable observation** like ‘**Mars going vakra near nakshatra Magha and also near nakshatras Jyeshtha/Anuradha & Jupiter going vakra near nakshatra Shrivana**’, implies that AV observation is proved to be useful through the reason that it is an objectively testable observation.

This blog entry shows that Nilesh Nilkanth Oak has not learned a single lesson in the astronomy of the vakri motion in the intervening period since he published his book in 2011. He has not realised that both Mahabharata astronomy and modern astronomy think alike in their theory of retrogression, a term whose Sanskrit equivalent is **Vakra**.

On understanding the concept of vakri, can one understand the verses of Mahabharata that associate *a single planet going retrograde in more than one place*. The Drishti of the vakri planets also make a retrograde motion as and when the planet keeps moving in retrogression. For interpreting astronomy references of Mahabharata, one must be with the term familiar with the concepts associated with these references. Oak is found woefully wanting in this crucial area. Reading books from the library or from Wikipedia won’t help. One must start from the basic concepts.

¹⁵¹Ibid. Page 81.

¹⁵²उपलब्धिसम (Balancing the perception)<https://nileshoak.wordpress.com/2019/04/19/%E0%A4%89%E0%A4%AA%E0%A4%B2%E0%A4%AC%E0%A5%8D%E0%A4%A7%E0%A4%BF-%E0%A4%B8%E0%A4%AE-balancing-the-perception/>

Faulty notion about Seasons.

Often he talks about seasons and says it is approximately of two lunar months. But Vedanga Jyotisha gives exact duration of a season as four and a half nakshatras transited by the sun.

ardhapañcamabhas tvrtuḥ (R-VJ 9d; Y-VJ 10d)

Four and a half asterismal segments is one *rtu*. (R-VJ 9d; Y-VJ 10d)

Note 1. The period of the Sun or Moon moving through $4\frac{1}{2}$ segments is a *rtu* related to it, i.e. the Sun's *rtu* or the Moon's *rtu*. But the popular *rtu* or seasons is only the Sun's. (Cf. the Vedic statement: *Madhuś ca Mādhavaś ca Vāsantikāv rtū* | *Śukraś ca Śuciś ca Graiṣmāv rtū* | *Nabhaś ca Nabhasyaś ca Vārṣikāv rtū* | *Iṣaś ca ūrjaś ca Śārādāv rtū* | *Sahaś ca Sahasyaś ca Haimantāv rtū* | *Tapas ca Tapasyaś ca Śaiśirāv rtū* | (Vāj. Sam. 13.25; Tait. Sam. 4.4.11.1).

Only the sun is the prime cause for the change of seasons and therefore rightly associated with seasons. *The sun's transit in two signs makes one season – with each sign having 2 and a quarter nakshatras.*

Seasons can also be defined in terms of **lunar months**. Yajur Vedanga Jyotisha¹⁵³ defines *season as 2 synodic months and 2 tithis*. This must not be construed as synodic months starting from a New moon or a Full moon. Vedanga Jyotisha calculates it from the beginning of the 1st year of the 5 year Yuga period, i.e. from the Uttarayana of the 1st year. When applied to Mahabharata events, the tithi- month alignment is perfectly in place. For example Krishna started from Upaplavya for peace mission at the end of Sharad season. This can be established by the ritu-calculation given in Vedanga Jyotisha for the 5 year period. In his complete ignorance of the Mahabharata calendar and excessive reliance on tropical zodiac of the modern software, Nilesh Oak is absolutely clueless on what Vyasa means by this. He admits that,¹⁵⁴

*“This Mahabharata reference contradicts practically all proposals for the year of Mahabharata War. This Mahabharata reference also contradicts my proposed timeline. The timing of Krishna's departure from Upaplavya, per my timeline, is during ‘Varsha’ season. This is **BASED ON THE ASSUMPTION THAT MAHABHARATA ASTRONOMERS DEFINED THE SEASONS IN THE SAME FASHION, AS WE UNDERSTAND THEM TODAY.**”*

When he could not know the basis of computation for season in Mahabharata, Nilesh Nilkanth Oak must have quit his research then and there and gone back to learn the basics. For his information, today, we are not following the season-calculation of the 5 year Yuga of

¹⁵³Yajur Vedanga Jyotisha. Verse 11

¹⁵⁴“When Did The Mahabharata War Happen?” Page 150

the Mahabharata period. His Voyager also cannot help him as it is designed for tropical zodiac that is, shifting zodiac. Mahabharata astronomy of the 5 year Yuga and even the Indian astronomy in vogue today follow the fixed zodiac by making constant ayanamsa corrections.

Nilesh Oak's faulty idea of rejecting Krishna's departure at the end of Sharad season will be taken up for analysis in the 12th chapter of this book in the context of establishing Mahabharata date.

Vyasa had knowledge of newly discovered outer-most planets?

Another shocker from Nilesh Oak is his postulation that *the three outer most planets of the solar system, Uranus, Neptune and Pluto were known to Mahabharata astronomers* (?)¹⁵⁵ He says that Mahabharata observations give rise to 5 opportunities that “*can be explained meaningfully only when we assume Mahabharata astronomers to have knowledge of all 9 planets of the solar system.*”¹⁵⁶ He makes this claim based on the following:

- Only the names of five planets (Mercury, Venus, Mars, Jupiter and Saturn) appear often in Mahabharata.
- In the two references¹⁵⁷ to “**Sapta Maha graha**” (7 planets), seven planets could be counted only by adding the outer most planets shown by the Voyager simulator. In another reference to ‘**Sapta graha**’¹⁵⁸ the counting is complete by adding the outer most planets shown by the simulator.
- The planets referred to by adjectives such as ‘Shyama’, ‘sweta’, ‘tivra’ and ‘tikshna’ cannot be deciphered without including the outer planets located by Voyager.

Analysing the verses on which these views have been made, we find that

- Nilesh Oak does not provide any evidence from Mahabharata text to show that Mahabharata does mention about 9 planets. Mahabharata talks about the 5 planets (Mercury, Venus, Mars, Jupiter and Saturn) and seven planets collectively, but never 9 planets. THE IDEA OF 9 PLANETS IS MODERN THAT INCLUDES EARTH ALSO AS A PLANET. If Nilesh Oak's version is to be accepted, then there must be 8 planets (5 + Uranus, Neptune and Pluto). Nowhere there is mention of 8 planets in Mahabharata.

¹⁵⁵“When Did The Mahabharata War Happen?” Page 38.

¹⁵⁶Ibid.

¹⁵⁷Reference no 24 and 25

¹⁵⁸ Reference no.23

- In Reference no 18 the verse says that Venus does a ‘parikrama’ near Purva Bhadrapada. Not knowing what this refers to, Niles Oak resorts to his one and only means of ‘knowledge’ of running the simulator and finds Neptune near Purva Bhadrapada. The issue here is, this is reported on the first day of the War when Oak claims the Sun was in Jyeshtha. If Sun was in Jyeshtha how could one locate Venus at Purva Bhadrapada, 81° away from the Sun, while as an inferior planet Venus cannot be sighted beyond 47.8° from the Sun? In Niles Oak’s astronomy this is possible. He doesn’t bother about the feasibility of an inferior planet appearing that far while he is up for a bigger discovery of spotting a superior planet, Neptune in Mahabharata astronomy!

There are three references on “Sapta Graha”.

- (1) Taking up Reference No 23, it is an analogy! It says,¹⁵⁹

te 'pīḍayan bhīmasenaṃ kruddhāḥ sapta mahārathāḥ
prajāsaṃharāṇe rājan somaṃ sapta grahā iva

It says seven Kauravas attacking Bhima was like seven planets attacking the moon. It does not say that seven planets were actually attacking the moon. If Niles Oak takes it as a real instance and traces it in Voyager only to see all the three outer-most planets among the seven on his date of Mahabharata War (14th day), I LEAVE IT TO THE READERS TO JUDGE THE ACUMEN OF THIS RESEARCHER WHO OFTEN COMPARES HIMSELF WITH COPERNICUS, KEPLER AND GALILEO!

- (2) The next reference on Sapta Graha is Reference No 24. The verse says,¹⁶⁰

maghā viṣayagaḥ somas tad dinam pratyapadyata
dīpyamānās ca saṃpetur divi sapta mahāgrahāḥ

Niles Oak interprets this verse as “**seven planets were seen near the Sun**”.¹⁶¹ Where does this verse say that seven planets were “near the Sun? Ganguli does not say that seven planets were ‘near’ the sun. Ganguli translates this verse as “*On that day on which the battle commenced Soma approached the region of Pitris. The seven large planets, as they appeared in the firmament, all looked blazing like fire.*”¹⁶².

¹⁵⁹ Mahabharata: 7-112-22 <http://www.sacred-texts.com/hin/mbs/mbs07112.htm>

¹⁶⁰ Mahabharata: 6-17-2 <http://www.sacred-texts.com/hin/mbs/mbs06017.htm>

¹⁶¹ “When did the Mahabharata War Happen?” Page 87.

¹⁶² Mahabharata: 6-17 <http://www.sacred-texts.com/hin/m06/m06017.htm>

{The day being the first day of the War, *Moon approaching the region of Pitris (Magha star) runs counter to Nilesch Oak's date of Jyeshtha as the first day of the war*. If Nilesch Oak's date is right Moon must be near Jyeshtha or Mula}.

Without establishing that the verse refers to seven planets near the Sun, Nilesch Oak goes on to **include outer planets in the list of seven** that were seen from east to west in the sky.

(3) The third reference to Sapta Graha is Reference No 25. It says,¹⁶³

nīscaranto vyadrśyanta sūryāt sapta mahāgrahāḥ

Ganguli translates this as “The seven great planets including the Sun seemed to proceed against one another (for combat).”¹⁶⁴

Nilesch Oak interprets this as, “Seven planets were seen going away from the Sun on the 17th day of War.”¹⁶⁵ This conveys *an impossible situation of seven planets going away from the Sun – which could happen if all the seven are in retrograde motion*. The impossibility of this meaning shows that the expression is metaphoric and not literal. But he says that “*The fact that seven planets could be seen in the sky immediately after the sunset is sufficient corroboration for this Mahabharata observation*” and continues to say that the moving away “*might refer to the fact that these seven planets were moving to the east, i.e. away from the Sun, unless of course any of them were in retrograde motion.*”

Without saying whether his simulator showed them in retrograde motion,^{166, 167} Nilesch Oak simply states that the “Voyager simulation showed that all planets were going away from (towards east) the Sun, with the exception of Pluto. Pluto was retrograde.” This means except Pluto none of the other planets (he mentions only five apart from **Pluto** – viz. **Neptune**, Mars, Venus, Mercury and Jupiter) were retrograde at that time. But Voyager shows them moving towards east! And his planetary list of the seven planets includes Mars which he locates at 46.6° behind the sun¹⁶⁸ on the very next day– a distance at which Mars can never go retrograde. *I leave it to the reader to judge the merit of Nilesch Oak's claim of these non-retrograde planets* (except Pluto which he treats as stationary due to its slow movement) moving towards east and the inclusion of two outer most planets in this list.

¹⁶³ Mahabharata: 8-26-34 <http://www.sacred-texts.com/hin/mbs/mbs08026.htm>

¹⁶⁴ Mahabharata: 8- 37 <http://www.sacred-texts.com/hin/m08/m08037.htm>

¹⁶⁵ “When Did The Mahabharata War Happen?” Page 87.

¹⁶⁶ Ibid. Page 88

¹⁶⁷ Ibid. Page 169

¹⁶⁸ Ibid. Page 86

The final references pertain to **Shyama** and **Sweta**. They refer to Venus and Moon respectively. There is a specific verse in *Brihad Jataka* by Varahamihira,

“gaura Indu...shyamah shukro Bhaskarihi Krishna dehah”¹⁶⁹

White (Sweta / Gaura) is Moon, Shyama (neither white nor black) is Venus and black is Saturn. This establishes that Mahabharata astronomy is nothing but astrology that continues till today without any change. Only in astrology we come across colours attributed to the planets.

Two more words are troubling Nilesch Oak. They are **Tivro** and **Tikshna**. Nilesch Oak thinks that these adjectives refer to some planets and takes a dig at other researchers that they “*can imagine these planets to be planets that suit their fancy but more likely those that suit their timeline.*”¹⁷⁰ Nevertheless he does the same by *interpreting the word Tivro to refer to Pluto to ‘corroborate’ his time line of Mahabharata War!*

“My task was then simply to re-confirm what Vartak has already figured out. Pluto is seen between Rohini and Krittika, rather closer to Rohini on the first day of War. This is sufficient corroboration of this Mahabharata observation” (of Krittikasu grahas tivro nakshatra verse).¹⁷¹

An explanation for this word is found only in astrology. ‘**Tivra**’ means sharp, hot, intense etc. Among the star categories, *Moola, Jyeshtha, Arudra and Aslesha are regarded as ‘sharp’ stars.*¹⁷² The sun was the “**Krittikasu graha**” and its transit across one of the Tivro stars is mentioned in the verse. Further explanation of this verse is given in the 12th chapter in the context of corroborating the planetary observations of Vyasa with the date of the war. It must be noted here that Pluto was not a ‘Tivro’ star.

Nilesch Oak follows the interpretation of Vartak and says that **Tivro** nakshatra in the verse refers to ‘**Pluto**’, simply because during his date of Mahabharata War, Pluto was in the sky near Krittika. In fact Pluto was near Rohini and not near Krittika. It doesn’t matter, “This is sufficient corroboration of this Mahabharata observation,” according to him.

The verse refers to a nakshatra not a planet! It doesn’t matter, *Vartak has “inferred that the word ‘nakshatra’ might have been used to mean ‘extremely slow moving planet’.”* **NILESH OAK’S** “TASK WAS TO RE-CONFIRM WHAT VARTAK HAS ALREADY FIGURED OUT.” Readers, please be

¹⁶⁹ Varahamihira, Brihat Jataka: II -4

¹⁷⁰ “When Did the Mahabharata War Happen?” Page 83

¹⁷¹ “When Did The Mahabharata War Happen?” page 83.

¹⁷² Dr.B.V.Raman, “Muhurtha”, p. 23

informed that **HE IS KEEN ON ESTABLISHING VARTAK MAHABHARATA AND NOT VYASA MAHABHARATA!**

If anyone says that bringing in Pluto here demands “**telescopic ability**, i.e. access to such instruments in Mahabharata times.” It doesn’t matter, “*this ability is also required to explain few other Mahabharata observations.*” If the reader thinks that those observations are of Vyasa, please be informed that they are the interpretations done by Nilesch Nilkanth Oak!

The readers can rest assured that **no outer planet was mentioned by Vyasa or any Mahabharata astronomer**. What they knew and talked about are Jyothisha – the science of Light – about light that reaches the earth. The Sun and the Moon are the Jyothir grahas (luminaries). They along with the 5 planets make up for seven planets. *Their light reaches the earth, so the science of these planets is known as Jyothisha*. One who understands the basis of the term Jyothisha can never hypothesise that the planets such as Uranus, Neptune and Pluto were referred to by Vyasa. The light of those planets do not reach the earth and that is why we cannot see them with naked eye.

Suppose in a context seven planets are mentioned along with sun or/and the moon, then the seven includes the five planets and the two nodes, Rahu and Ketu – the **Chāya grahas** (shadow planets). Only these nine are called as ‘grahas’ and find mention in Mahabharata. Etymologically a graha is “that which seizes the fates of men”.¹⁷³ Uranus, Neptune and Pluto were never assigned graha status of seizing the destiny of man.

Nilesch Oak must also know that **THERE IS NO MAHABHARATA ASTRONOMY, BUT ONLY MAHABHARATA ASTROLOGY - THE ASTROLOGY BEING VEDIC IN ORIGIN.** All the terms he has used in this book are found in astrology texts, with some of them coming under Gaṇita part of astrology. Whether he accepts it or not, this is the fact.

There is yet another major concept of Mahabharata astronomy mis-interpreted by Nilesch Oak. That is discussed in the next chapter.

¹⁷³ Dr D.Arkasomayaji, “Siddhanta Siromani of Bhaskaracharya,”(1980) Page 19

Chapter 5

FAULTY CONCEPT OF EQUINOXES AND SOLSTICES

Continuing with Nilesh Nilkanth Oak's ideas about Mahabharata Astronomy, one can see a complete mis-reading of ancient astronomy in Nilesh Oak's application of tropical position of equinoxes and solstices to Mahabharata astronomy. Oak knows very well that Mahabharata astronomy is **sidereal**. He is found expressing this in his lectures. But one is at a loss to understand why he has used tropical locations of the simulator for Mahabharata references to seasons and solstices. He is aligning seasons with tropical zodiac of western astronomy and has even written that "*every 2000 years, the beginning of a season precedes by one lunar month!!*"¹⁷⁴

He further describes that

"the tropical year, measuring the cycle of seasons (for example, the time from solstice to solstice, or equinox to equinox) is about 20 minutes shorter than the sidereal year, which is measured by the Sun's apparent position relative to the stars. Note that 20 minutes per year is approximately equivalent to one year per 26000 years, so after one full cycle of approximately 26000 years, the positions of the seasons relative to the orbit are "back where they started".""¹⁷⁵

This passage shows that he recognises the difference between assessing a season from sidereal and tropical point of view. But what does he do about it in his research? HE APPLIES THE TROPICAL POSITIONS OF VOYAGER- SIMULATION NYAYA TO MAHABHARATA ASTRONOMY!!

This Nyaya has emboldened him to say that *the lunar month of Chaitra started in winter in the year close to his date of Mahabharata war!* He states this while accusing **Pushkar Bhatnagar** for sticking to sidereal astronomy of Mahabharata.¹⁷⁶

¹⁷⁴"When did the Mahabharata war happen?" Page 39.

¹⁷⁵Ibid. Page 19.

¹⁷⁶ "Rama – Janma & Goebbels Law" <https://nileshoak.wordpress.com/2015/09/22/rama-janma-goebbels-law/>

Important point for our analysis of Shri Bhatnagar's research is that, while he understood this shift for correspondence between Indian lunar months and months of Julian/Gregorian calendar, he completely missed the implication of 'precession of equinoxes' for the shift in season for a given lunar month. A season would shift by one lunar month approximately every 2000 years due to the 'precession of equinoxes'.

No wonder Shri Bhatnagar is assuming lunar month of Chaitra to be that of spring (Vasanta), even in 5000 BCE, while the reality is that lunar month of Chaitra coincided with the peak of winter (interphase of Hemant and Shishir seasons) during 5000 BCE. During the period of 5000 BCE, lunar months coincided with six seasons as follows:

Couldn't he think for a moment that Mahabharata people **did not even accept a run-away lunar month every two and a half years** and therefore by choosing to ignore it, brought it back to the original sidereal position? Even in the regular yearly cycle, the month of Chaitra slips back into Pisces. But what did they do and what do we do even now? We expunge the run-away month to make Chaitra align with solar month of Chitra. The concept of **Adhika Masa** comes into relevance here. When this adjustment is taking place regularly and without respite till date, how could one even imagine that Chaitra month slipped into winter?

Seasons never changed over millennia.

Brihat samhita offers lot of hints that seasons remain the same all these years. In 111 verses covering 6 chapters this text expresses the views of sages such as **Garga** and **Parasara** of Mahabharata period on rainfall season. These sages talked about a concept called '**pregnancy of clouds**' that take place much in advance but pour down as rains after six and a half months.¹⁷⁷ According to them the occurrence of "**pregnant clouds**" must be watched right from the month of Margashirsha until Chaitra (5 months). The resultant rains falling after six and a half months must begin from Jyeshtha and last till the lunar month of Kartika. They have specifically said that rains would go on until the bright half of Kartika.¹⁷⁸ This is exactly the time period of rainfall today also. In other words, **THE RAINFALL SEASON AS IT EXISTS TODAY BETWEEN THE MONTH OF ASHADHA AND KARTIKA HAD OCCURRED IN MAHABHARATA TIMES IN THE SAME MONTHS.**

Ramayana too speaks about the concept of 'pregnancy of clouds'. **Rama** refers to this as "*nava maasa dhritam garbham Bhaskarsya Gabhastibhih*"¹⁷⁹ In Ramayana too, the peak rainy season had started from Ashadha month only. Rama speaks about rainfall for four months

¹⁷⁷Brihat Samhita: Chapter 21.

¹⁷⁸Ibid. Chapter 21-12.

¹⁷⁹Valmiki Ramayana: 4-28-3

starting from Ashadha when people would remain wherever they were by observing a 4-month vrata.¹⁸⁰ *This vrata continues to be in vogue till date for the same rainy months.*

This shows that the rainy season peaked from Ashadha in Rama's times and also in Garga's times (Mahabharata) as it is so even today. What does this convey except that *the seasons and the months of the seasons had not changed right from Ramayana times?* **THE REASON IS THAT THE SEASONS ARE ALIGNED TO THE SIDEREAL POSITION OF THE SUN.** The Vedic society aligned the sun's position with the stars so that it always rained in Ashadha and was always hot when the Sun crossed the fiery stars Bharani and Krittika. So any verse in the Epics on seasons cannot match with the seasons of the tropical zodiac of the astronomy software. Unaware of this difference

*Nilesh Oak writes in the chapter on Mahabharata Astronomy that the "Precession of equinoxes affects beginning of new season with respect to Indian lunar calendar. Every two thousand years, the beginning of a season precedes by one lunar month."*¹⁸¹

The Sun is the crucial factor in causing the seasons. To keep the seasons unchanged in the backdrop of the moving zodiac, the Vedic seers had held on to the sidereal position of the sun and the moon. Moreover they had also noticed that **THERE IS NO CONTINUOUS PRECESSION OF THE EQUINOXES.** The equinoctial point had moved backward and forward in the backdrop of stars within a short period. *This idea of the Vedic culture is yet to catch up with western astronomers.* Any time soon this idea will become mainstream as a section of *researchers have started noticing absence of axial tilt of the earth*, thereby ruling out earth's motion as causative for precession.

In Nilesh Oak's astronomy, the never ending 'precession of equinoxes' is the solution to many features. According to him the 'precession of equinox' changes the seasons and even changes the Arundhati- Vasishtha orientation! He is seen to cling on to the tropical zodiac simulations of the Voyager software to locate equinoxes and solstices of the Mahabharata Era that are based on oscillation concept of the equinoxes. **HIS ENTIRE WORK ON THE DATE OF MAHABHARATA AND RAMAYANA CRUMBLES UNDER THE WEIGHT OF HIS FAULTY NOTION.** Let us see what is faulty about his notion of the precession of equinoxes.

¹⁸⁰Valmiki Ramayana: 4-28-55

¹⁸¹"When Did The Mahabharata War Happen?" Page 39

Understanding Precession of Equinoxes.

Western astronomy defines Equinox as the point where the ecliptic crosses the celestial equator.¹⁸² The ecliptic is the path of the apparent motion of the sun around the earth, but in reality it is the projection of the earth's path around the sun. In Figure 6, it is depicted as a red circle. The white circle is the celestial equator which is the projection of earth's equator into space that forms an imaginary circle around the earth and is at equal distance from the celestial poles. The point of intersection of the two is defined as the equinox.

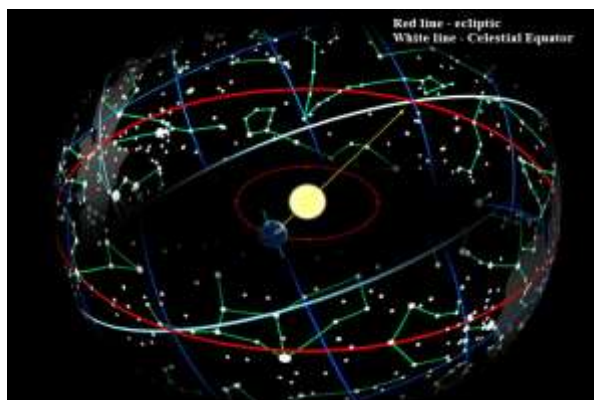


Figure 6: Locating the equinoxes

This point of intersection is precessing backwards and is believed to make a full circle around the zodiac – the period of which is differently hypothesised. Based on this it is being held that the seasons also would precede - an idea that Nilesch Oak had borrowed from the current thinking in the western world.

Let us see what the ancient sages of India had told about this. There is a verse in **Surya Siddhanta** on this and how far the precession can go. It says,¹⁸³

“The circle of asterisms librate 600 times in a Great Yuga” (that is to say, all the asterisms, at first, move westward 27°. Then returning from that limit they reach their former places. Then from those places they move eastward the same number of degrees; and returning thence come again to their own places. Thus they complete one libration or revolution, as it is called. In this way the number of revolutions in a Yuga is 600 and 600,000 in a Kalpa).”

Following this, verses 11 and 12 do state the (observed) change in eastward movement, that is, forward movement of the equinox and again turning back westward.

¹⁸²<http://www.physics.csbsju.edu/astro/newcomb/II.7.html>

¹⁸³Surya Siddhanta Chapter 3-9 Translation and interpretation by Pundit Bapu Deva Sastri.

The same verse is translated by Burgess as “In an Age (yuga), the circle of the asterisms (bha) falls back eastward thirty score of revolutions.” Though he accedes that the term ‘trinsatkritya’ in the verse refers to ‘thirty twenties’ which is equal to 600 and the libration is 27° on one side before turning to the other side, he could not comprehend how this works.

The deduction from these verses is as follows:

Duration of the Great Yuga (Chatur Maha Yuga) = 43,20,000 years

Number of librations or rotations of equinoxes in this period = 600

Time taken for one rotation of the equinox = $43,20,000 / 600 = 7200$ years.

This is apportioned into four segments of 27° each covering 1800 years. This is illustrated in Figure 7:

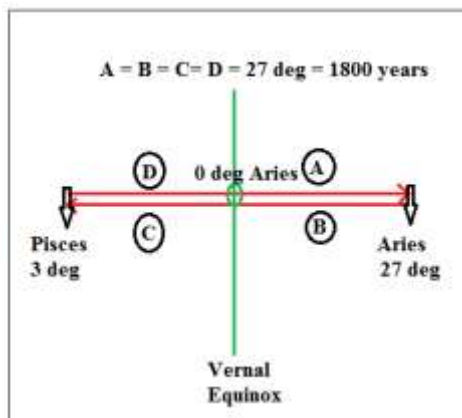


Figure 7: To and fro oscillation of the Equinox

Figure 7 shows the vernal equinox at zero degree Aries. It goes in forward motion till it reaches 27 degree Aries and then reverses the direction and moves back towards Aries. This takes 54 degrees ($A + B = 27 + 27 = 54$) in 3600 years ($1800 + 1800$). *Seen from one end to another, the equinox moves in one direction for 54 degree length and goes in opposite direction for another 54 degree length of space.* TOTALLY IT TAKES 108 DEGREES (54 + 54) TO COMPLETE ONE REVOLUTION WHICH WILL BE SEEN AS TO AND FRO MOTION OF A PENDULUM FOR AN OBSERVER ON THE EARTH.

The Pendulum movement of the equinox.

Modern science shows the following figure to show precession and the change of the pole star along the path described by the axial rotation of the earth. The inscribed circle is called **Precession Circle** and the motion, **axial precession**. This takes approximately 25,800 years according to modern science, but Vedic wisdom ascribes only 7200 year cycle.

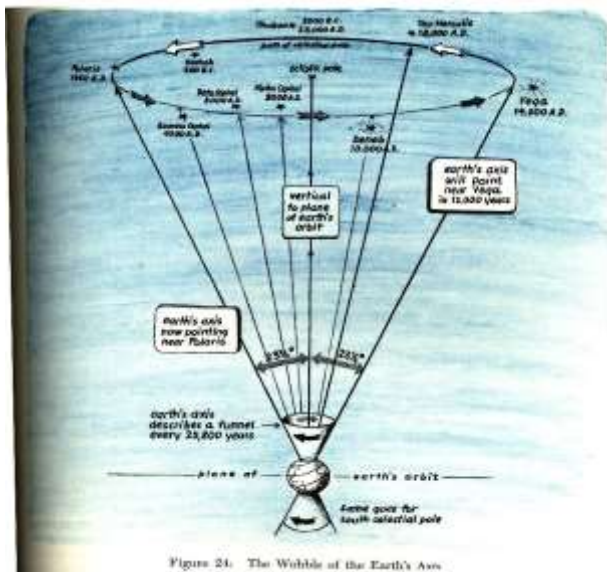


Figure 8: Precession circle as per western science

(Picture courtesy: <http://spiff.rit.edu/classes/phys301/lectures/precession/precession.html>)

The current state of observation can be described as follows.

The earth's axis cuts the equator at right angles, making equator and the axis always separated by 90° (Figure 1 below). If the axis tilts by say, 23° , the equator also tilts by 23° as they always remain perpendicular to each other. Due to this the solstices which define the northern most and southern most limits of the transit of the sun, also will be at the latitude of 23° from the equator on either side of it. Today the axial tilt is $23^\circ 26' 12.4''$. Without a second thought one can easily say that the summer solstice (Tropic of cancer) falls at $+23^\circ 26' 12.4''$ in the northern hemisphere and the winter solstice (Tropic of Capricorn) falls at $-23^\circ 26' 12.4''$ in the southern hemisphere.

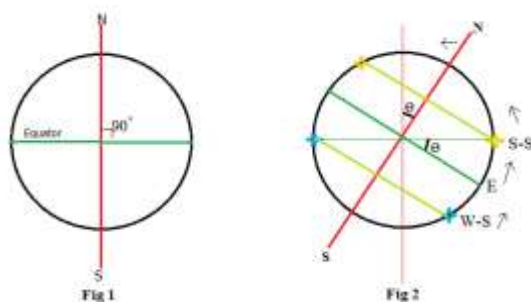


Figure 9: Changing solstices and equinoxes

S-S: Summer Solstice, W-S: Winter Solstice. (Markings applicable for Northern Hemisphere)

In Figure 9, the inset Fig1 shows earth with its axis straight. In this position there is no change in the seasons as the sun will be always shining at the equator. Inset Fig2 shows tilted

earth by which the sun light falling on a place changes periodically as the earth rotates. Till now it was theorised that the changing degree of the axis of the earth is making this happen.

EMERGING TRENDS IN SCIENCE SHOWS THAT THE ENTIRE SOLAR SYSTEM IS TILTING IN A CURVED PATH.

Researches also show that *what is known as precession is indeed the movement of the sun in its path*. Whether this movement is happening along with a binary around a barycentre, or just spiralling is not known. Anyway the discovery that precession is caused by the moving sun in the backdrop of stars and not by the independent axial movement of the earth is going to **change the existing concepts** leading to an overhaul of the simulators.

IN THE ABSENCE OF AXIAL PRECESSION OF THE EARTH, IT CANNOT BE THEORISED THAT THE EARTH'S AXIS IS ROTATING LIKE A TOP OR A GYROSCOPE. A recent research done in space station at zero gravity showed that gyroscope does not rotate like a top.¹⁸⁴ Its axial alignment continues to be same which means the axial rotation of the earth as it moves in zero gravity of space is not gyroscopic or like a top. **IN THE ABSENCE OF GYROSCOPIC MOVEMENT OF THE AXIS OF THE EARTH, THE CIRCLE OF PRECESSION ALSO BECOMES NULL AND VOID.**

With these evolving trends, days are not far off to prove the time tested and visually observed Vedic wisdom of 54 + 54 degree movement in 7200 years. The early sign of this wisdom in provable terms – but not yet observed by the scientific community is the fact that the point of solstices observed as shadows on the earth keeps moving at the rate of 66.66 years per kilometre which is nothing but the average speed of precession (movement of the equinox) as per Surya Siddhanta.

In Figure 9, the arrow mark near the Northern axis shows the direction of the axial tilt as it is today. Presently the angle of the tilt is decreasing (because the entire solar system is tilting as it moves on). This means the solstices are moving northward. Presently this movement is 0.47 arc seconds or 15 metres per year towards north¹⁸⁵ which works out to 66.66 years per kilometre. Once the axial tilt starts increasing, there will be a reversal of the direction of the solstices and equinoxes. At that time the solstices will start moving southwards.

The logical derivation of the rotating tilt is that the equinoxes are seen to be making to and fro motion in the backdrop of stars for an observer on the earth. This was conceptualised or visibly noticed over a period of time by our sages.

¹⁸⁴https://www.esa.int/ESA_Multimedia/Videos/2016/03/Gyroscopes_in_space

¹⁸⁵Tropic of Capricorn https://en.wikipedia.org/wiki/Tropic_of_Capricorn

Figure 10 expresses the till-now perceived concepts of modern science. The points of tropical equinoxes are expressed as Vernal Point and Anti-VP in the figure.

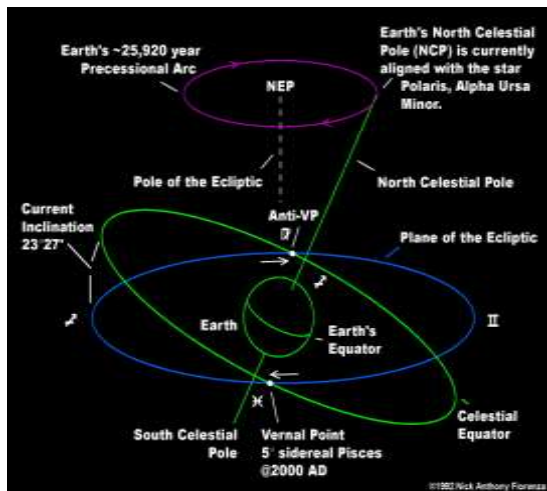


Figure 10: Present concept of precession

The point of intersection is where the sun is seen above the equator in the globe. This point keeps shifting in the backdrop of stars. The maximum limit of this shift can be made out from figure 11.

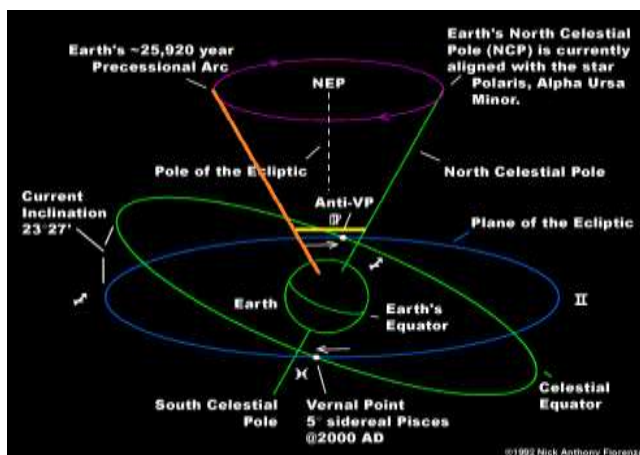


Figure 11: Maximum extent of precession as per western science

In Figure 11, the two extremes of the precession circle as per western science are shown like the edges of a funnel. The horizontal line (yellow) between the two equinoctial points (at the bottom of the funnel) shows the limit within which the sun can be seen to move at the backdrop of the stars. On reaching one end of this, the equinox turns around because the sun curves around in its spiralling path. This is depicted in Figure 12.

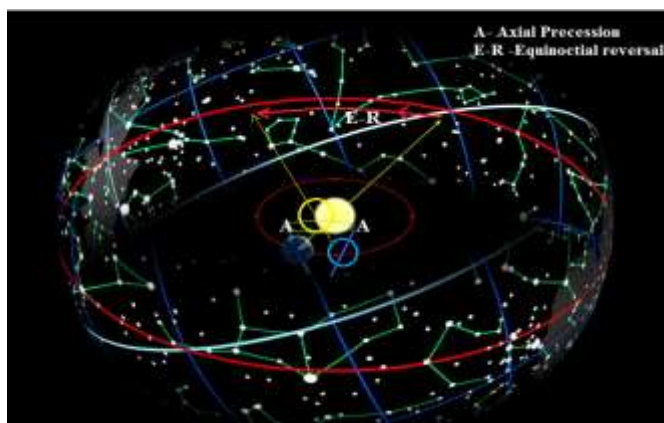


Figure 12: Equinox tracing limited span of the sky

In Figure 12, AA represents the limits of solar shift as the sun moves. Correspondingly the equinoctial point moves, not around the zodiac but within the limited region of the sky marked as ER. From the earth this will appear as a two-dimensional backward and forward movement. The Vedic society had identified the midpoint of this equinoctial precession circle at 0° Aries. This point is like the state of rest of the pendulum. When the clock starts ticking the pendulum moves in one direction, returns to the original location, and keeps moving to the opposite direction and from there return to the original position and repeats this continuously forever. In this way there are 4 equal segments in a complete circle of the pendulum. Similarly the Vedic sages have identified 4 segments of equinoctial circle, each measuring to a span of 27° .



Figure 13: To and fro movement of the equinox

Figure 13 shows pendulum movement of the equinox in 4 segments each covering a distance of 27° of the sky. The oscillation goes upto 3° Pisces and 27° Aries on either side of 0° Aries. This is the extent of Vernal equinox in northern hemisphere (Figure 14)

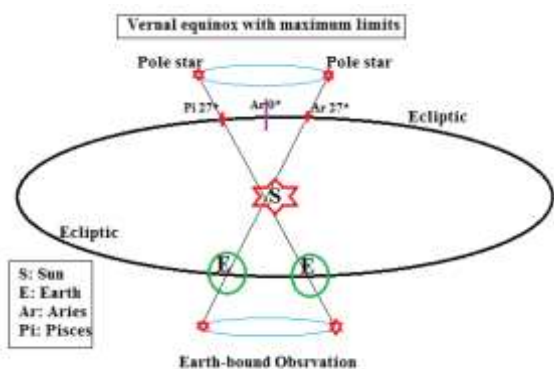


Figure 14: Limited oscillation of the vernal equinox

The equinoctial movement at the south (autumnal equinox) crosses 0° Libra as the pivot and moves 27° on either side. Figure 15 shows that.

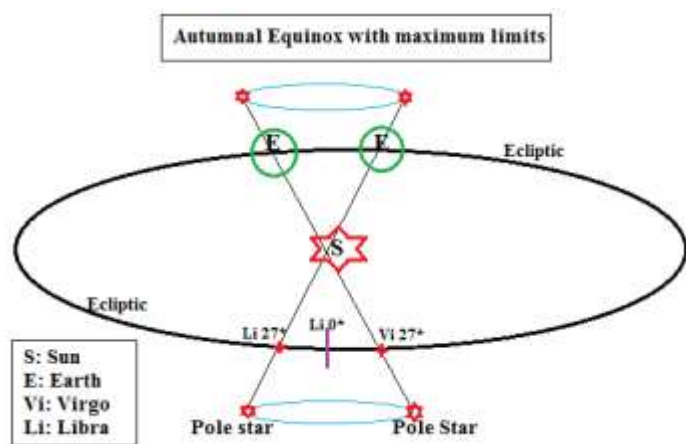


Figure 15: Limited oscillation of the Autumn equinox

(For illustrative purpose only)

Today the Vernal equinox is at 6th degree Pisces which means that once the sun reaches the 3rd degree, the vernal equinox would start reversing towards Aries. This is an outstanding discovery of our sages, yet to be recognised by the scientific community.

The main implication of this is that the solstices (*ayanas*) would also move upto 27° only. When the equinox is at 0° Aries, the winter solstice (**Uttarayana**) would be 90° to its left – that is, at 0° Capricorn in the zodiac. The summer solstice (**Dakshinayana**) would be at 90° to its right, at 0° Cancer.

If the equinox shifts upto 27° in Pisces, Uttarayana would move down upto the 3rd degree of Sagittarius (**Moola nakshatra**). Similarly Dakshinayana would move upto the 3rd degree of Gemini (**Mrigashirsha 3rd Pada**). On the other extreme when the equinox moves upto 27 degrees on the right side, it would be at **Krittika 1st pada**. At that time **Uttarayana** would at

Dhanishtha 2nd Pada, the 27th degree of Capricorn. And **Dakshinayana** would be at **Aslesha** 4th Pada (27th degree of Cancer). This is the basic concept given by **Surya Siddhanta**. *Anytime in the past the maximum limit of vernal equinox was Krittika only.* AT ONE TIME IT WENT UPTO ROHINI – BUT THAT WAS THE TIME KRITTIKA WAS NOT INCLUDED IN THE ZODIAC AND THE STAR-LINE-UP WENT ON AS ASWINI, BHARANI AND ROHINI ETC. That will be written in the 13th Chapter.

This libration is comparable with the movement of the two pans of the Balance. The pivotal pointer can be compared with the axis of the earth. Figure 16 shows the horoscopy design of coastal Andhra and some parts of North India, with a physical balance superimposed on it.

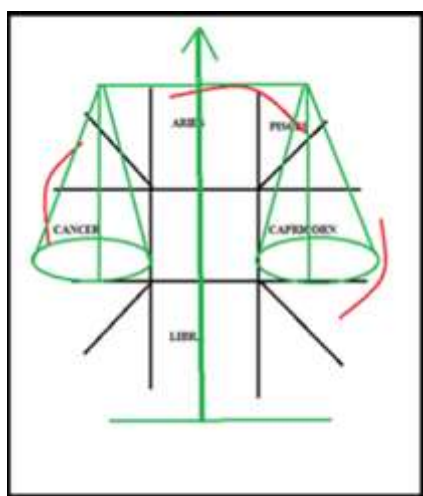


Figure 16: Horoscopy design inscribed with a balance

The zero point of the Balance is comparable with the vernal Equinox at 0° Aries. The pointer moves like the polar axis. With the movement of the pointer the pans keep librating up and down. That is how the ayanas (solstices) move up and down but not beyond a point. The base constellation has been rightly named as ‘Tula’, the balance. It is named Libra after a Latin word for libration (swaying). But unlike the Balance, the equinoctial balance can never be at rest.

Evidence of Precession concept of Surya Siddhanta in other texts.

This precession concept was in vogue throughout India in olden days. It is known from a verse in Tamil Sangam texts which expresses the location of planets only in terms of ‘Streets’ (**Veethi**).¹⁸⁶ The signs travelled by the equinoxes were collectively known as Middle Street or Middle Path (**Madhya Veethi**) (Figure 17)

¹⁸⁶Paripaadal: Verse 11

This Veethi concept has application in horary astrology (Prasna or Nimitta)¹⁸⁷ where planetary positions are checked in terms of **Chatra Rashi** – a term for the division of the zodiac in terms of Veethi.

The Veethi concept is found in **Vālmiki Ramayana** also. The autumnal equinox is mentioned by sage Vālmiki by the name of a Veethi. He says ¹⁸⁸

स नलेन कृतः सेतुः सागरे मकर आलये ॥ २-२२-७२

शुशुभे सुभगः श्रीमान् स्वाती पथ इव अम्बरे ।

sa nalena kR^itaH setuH saagare makara aalaye.

shushubhe subhagaH shriimaan svaatii patha iva ambare."

(**Meaning:** “The beautiful and lovely bridge constructed by Nala across the ocean of alligators shone brightly like SWATI PATHA in the sky!”)

Patha means road or Veethi. *Setu bund is compared with Swati Patha to imply that it divided the ocean into two.* This refers to THE EQUINOX THAT DIVIDES GLOBE AT THE EQUATOR. This reference could only happen if the autumnal equinox was running at **Swati**! This proves that the Veethi concept was in vogue in Ramayana times!

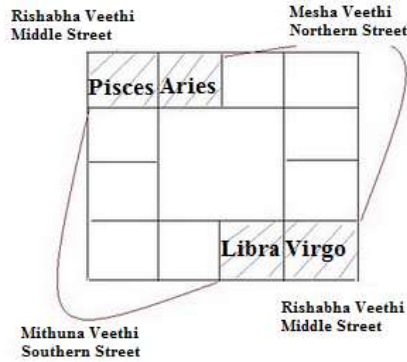


Figure 17: The three Veethi-s

The Veethi concept is also given in **Vayu Purana** corroborating the derivation we made from Surya Siddhanta. It tells about a northern street called **Naga Veethi** and a southern street called **Ajaveethi**. It says

“when the sun rises in the constellations Mula, Purvashada and Utrashada it is called Ajaveethi. When the sun rises during the rise of the three stars after Abhijit, it is called Nagaveethi.”¹⁸⁹

¹⁸⁷Prasna Marga. Chapter-8

¹⁸⁸ Vālmiki Ramayana: 6- 22 - 72

The verse is a clear indication of *northern movement (Uttarayana) of sun limited to the extent of Mula only*. With the three stars from Mula occurring south of Makara, it was given the name, Southern street (where Uttarayana happens as it is happening today). From Mula, Uttarayana starts moving forward. The verse refers to three stars after Abhijit. After Abhijit, come Uttarashada, Shravana and Dhanishta. After crossing Makara – where Abhijit was once located, but now occupied by Uttrashada the northern movement of the ayana could go only upto Dhanishta after which the movement would be reversed. This part of the movement was known as **Northern Street**. This is depicted in another way as in Figure 18.

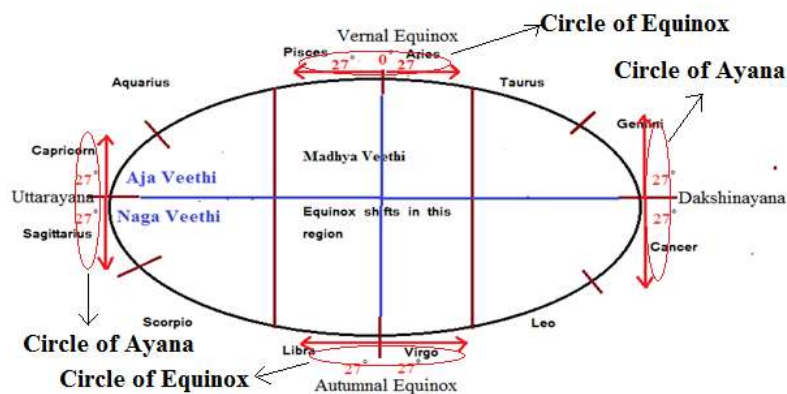


Figure 18: The Veethi concept of the solstices and equinoxes

Figure 18 shows that the equinoxes and the solstices do not travel around the zodiac. Each of them makes short to and fro movement of 54° at one direction. These concepts are yet to catch up with the modern researchers.

In modern astronomy, the purpose of sticking to the moving Vernal equinox is to have a reference point to locate the celestial objects in the sky. *That concept cannot be taken up for determining the equinoxes in Mahabharata and Ramayana that were basically aligned with sidereal concept* as explained above. Modern astronomy simulators have not yet worked on the mismatch their tropical calendar is going make with actual seasons. With the movement of vernal equinox, the months of the Gregorian calendar would have to be adjusted someday to be in tune with the seasons. Or else we will find April in winter in the tropical calendar in course of time. This kind of mismatch doesn't happen in the Indian (Vedic) sidereal calendar. It would always show summer in April (Chaitra / Chitra) only. But **NILESH OAK SHOWS US CHAITRA IN WINTER AT 5000 BCE BY BLINDLY FOLLOWING THE TROPICAL CALENDAR OF THE ASTRONOMY SOFTWARE AND THOUGHTLESSLY APPLYING IT TO MAHABHARATA ASTRONOMY.**

¹⁸⁹Vayu Purana: 50-130.

Checking the first 4 experiments given by Oak in his book that appear in the context ‘FALL OF ABHIJIT’, all of them crumble down in the face of the tropical positions used by him from Voyager- Simulation Nyaya!¹⁹⁰

- His 1st experiment is falsified because he theorises that winter solstice progressed from Rohini to Dhanishta. Rohini is always at the end of vernal equinox. If it is located at winter solstice in 9500 BCE then it means the earth had tilted by 90° - an impossible event.
- In his 2nd experiment he places Rohini at Autumnal equinox in 16000 BCE which is possible if the earth had completely made a reversal by turning 180°
- In his 3rd experiment he locates Dhanishta in summer solstice in 14500 BCE which can happen in a clock-wise movement of the earth’s axis by 180°
- In experiment 4, he sees Dhanishta in vernal equinox in the year 20,000 BCE. This can happen by pushing the axial tilt by 270° in anti-clockwise direction. He locates Abhijit at some point near the North Pole in all these experiments without realising how Abhijit can remain at the northern polar region with all these quick movements of earth’s axis.

Time factor deduced from Surya Siddhanta concept of equinoxes.

The verse of **Surya Siddhanta** gives a remarkable insight into calculating the precession rate. The verse says that the circle of 27° x 4 makes 600 revolutions in a matter of 43, 20,000 years (= 1 Chatur Maha Yuga).

$$1 \text{ revolution} = 27 \times 4 = 108^\circ$$

$$600 \text{ revolutions} = 108 \times 600 = 64,800^\circ$$

$$64,800^\circ = 43, 20,000 \text{ years}$$

$$\text{Therefore } 1^\circ = 66.66 \text{ years}$$

Or precession of 54 arc seconds per year.

TODAY THE PRECESSION RATE IS 72 YEARS PER DEGREE OR 50 ARC SECONDS PER YEAR.

But the average rate is 66.66 years per degree as per Surya Siddhanta.¹⁹¹

This gives a basic revelation that precession rate was not constant at all times in the past.

¹⁹⁰“When Did The Mahabharata War Happen?” Pages 48-50

¹⁹¹Others such as Bhaskara II and Munjala have given different rates of precession. The causes can be many but it ultimately proves that precession rate is not constant at all times.

This means THE SIMULATORS FED WITH THE INPUT OF THE CURRENT RATE OF PRECESSION CAN NEVER GIVE THE CORRECT POSITION OF THE PLANETS OF THE MAHABHARATA OR RAMAYANA TIMES WHEN THE PRECESSION RATES WERE DIFFERENT.

The slower rate of precession compared to the average rate could mean that precession is slowing down perhaps owing to the fact the cycle is nearing the turn- around. However with recent observation showing an increase in the precession rate, it is understood that the path is at the verge of a turn around. From the present location of Uttarayana at 6 ° in Moola, it is only 3 to 4 degrees to make a turn around.

Deducing the equinoctial position during Mahabharata.

With available inputs on Uttarayana in the past, we can deduce the approximate date of Mahabharata and Lagadha's Rig Jyothisha using this precession rate.

The Rig Jyothisha of Lagadha clearly says that Uttarayana started in Dhanishtha. Assuming that to be the maximum extent of 27 degrees in Capricorn, we can find out the date of that time.

After Lagadha's times, the Uttarayana had reversed and reached the current location of 6° in Sagittarius.

Between Lagadha and present time = $27 + 24 = 51^\circ$

At the current rate of 72 years / degree this is = 3672 years

At the rate of 66.66 years /degree this is = 3399.66 years

Deducted from 2019 CE, the time of Lagadha's Rig Jyothisha ranges from 1653 BCE to 1380 BCE (for the above 2 values)

Suppose the traditional date of Mahabharata war is taken as 3136 BCE, the Uttarayana position must be as follows:

Number of years lapsed from 3136 BCE to 2019 CE = 5155 years.

At the current rate of 72 years / degree = 71.59°

At the average rate of 66.66 years / degree = 77.33°

Deducting the current location of Uttarayana we get

Uttarayana during Mahabharata war = 6.01° Capricorn (at the current rate of precession)
Or Uttarayana during Mahabharata war = 0.27° Capricorn (at the average rate of precession) (close to the location of Abhijit)

The star Uttrashada is located at this degree. And the Uttarayana is ascending, i.e. there is **no precession of equinox in Mahabharata times!**

NILESH OAK HAS OVERLOOKED VEDIC CONCEPT OF PRECESSION. In his complete dependence on the software with no basic idea of the concepts, he had failed to understand that the changes in precession rates in the past are bound to give wrong reading of the position of the planets in the software. For that matter any researcher working on the date of an ancient event like Mahabharata war must be conscious of the grey area of varying precession rates in the past and must exercise caution in choosing the right factors for dating. Mere number of astronomy references does not make a research a quality one. Just three or four astronomy references would do provided they are well corroborated within the text or through means applicable to the period under consideration. Nilesch Nilkanth Oak's research is a far cry in this crucial aspect.

Chapter 6

METHODOLOGY: FLAWS IN APPLICATION OF POPPER'S FALSIFICATION

Choice of methodology is important in historical research as much it is in scientific research. In a historiographical research to find out the date of Mahabharata war on the basis of internal inputs of a literary work, Nilesch Oak has opted to use the falsificationist methodology of the philosophy of science proposed by the Austrian born British philosopher, **Sir Karl Popper**. According to Karl Popper, *to be scientific means to be falsifiable and testable*. A theory can be verified to be true in many ways, but a single statement or singular statements can falsify that theory. In view of the asymmetry between verifiability and falsifiability,¹⁹² the falsification done by the singular statement is considered to be of vital importance in establishing scientific theories. Nilesch Oak found this to be applicable to A-V observation and has noted in his book as follows:

*"I found it fascinating that my approach to this problem (A-V observation) was very much along the lines of 'testability', 'falsifiability', and 'simplicity' as espoused by Karl Popper."*¹⁹³

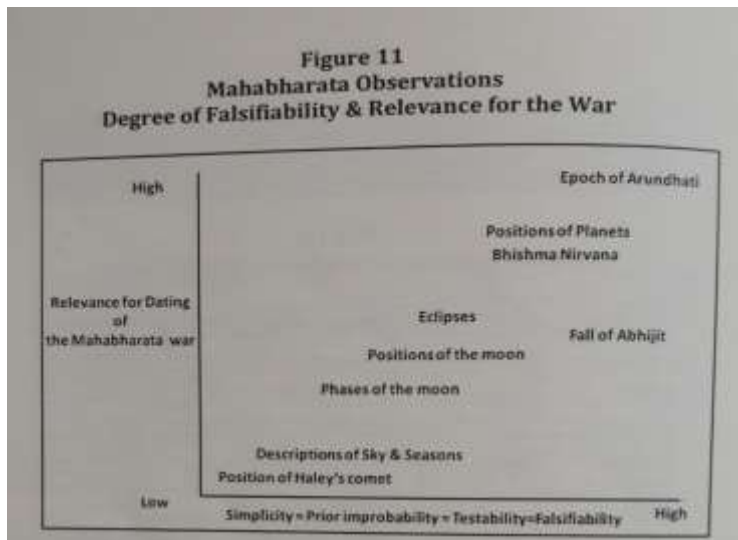
He further writes that that falsifiability is the only criteria to test the astronomy observations of the Mahabharata text. *He treats A-V observation as an astronomy observation though it is presented by Vyasa along with scores of non-astronomy observations* and accords to it the highest degree of falsifiability.¹⁹⁴ He puts it on top of the graph in Figure 11 in his book for highest relevance (among other astronomy observations) for the date of Mahabharata War. He justifies highest relevance and falsifiability of the A-V observation on the pretext that the *"ability of Arundhati observation to predict the time interval for the plausible year of Mahabharata War is not affected, when all other Mahabharata observations are eliminated."*¹⁹⁵

¹⁹²Karl Popper, "The Logic of Scientific Discovery" (English edition 1959), Page 19

¹⁹³"When Did The Mahabharata War Happen?" Page 58.

¹⁹⁴Ibid. Page 201- 203

¹⁹⁵ Ibid. Page 201



Writing about the above Figure in his Introduction, Oak says that¹⁹⁶

“Higher the testability of an observation, higher is its relevance for the dating of Mahabharata War and this higher is worth of such an observation! Of course, this is not a new realization but rather a validation of Popper’s emphasis on falsifiability, simplicity and testability.”

A single observation taken as a test of falsification resulted in the discovery of the “Epoch of Arundhati” across a period of 6000 years when Oak thinks Arundhati star walked in front of Vasishta.

Let us first look into the admissibility and viability of this methodology for dating the Mahabharata War.

1. Nilesh Oak’s research justifies Kuhn’s criticism of Popper’s methodology that result is what one wants to see.

First and foremost it is surprising that Nilesh Oak has picked up a methodology that is no longer accepted within philosophy of science. There are no takers for Popper’s falsificationist theory that a single counter instance is sufficient to reject a theory. The foremost criticism of this methodology given by Thomas Kuhn is that **“OBSERVATION IS ITSELF STRONGLY THEORY-LADEN, IN THE SENSE THAT WHAT ONE OBSERVES IS OFTEN SIGNIFICANTLY AFFECTED BY ONE’S PREVIOUSLY HELD THEORETICAL BELIEFS.”**¹⁹⁷

¹⁹⁶Ibid. Introduction page 9

¹⁹⁷“Karl Popper: Philosophy of Science” <https://www.iep.utm.edu/pop-sci/>

This criticism perfectly holds good for Nilesh Oak who keeps repeating how he was obsessed with the A-V observation. His ‘liking’ and “fascination” for this A-V observation is expressed throughout his book and speeches. His was not an urge to date Mahabharata war, but it was an instant liking he had taken for the A-V observation in which *he sensed scope for clinching a “revolutionary” theory if he could prove it scientifically*. This made him look for what others had said on this observation, rather than checking A-V observation in the light of other references to Arundhati in Mahabharata or Vālmiki Ramayana. As a result he was “astonished” to know that only four researchers had mentioned this observation ¹⁹⁸ while *the fact remains that Nilesh Oak had not checked even a single observation on Arundhati other than the A-V observation found within the text of Mahabharata*.

His obsession with this observation grew manifold when he came to know *that P V Vartak was the only researcher to have treated the A-V observation as a true astronomy observation*. After he went to **Calgary** he started gathering material to satiate his fascination for this observation. He learnt the basic astronomy terms, bought astronomy catalogues, bought astronomy simulator which he kept running for years to see when Arundhati walked in front of Vasishta. At last he says “**Lady Arundhati was finally pleased with my efforts**” when he could see her walking ahead of her husband in the simulator! His obsession has gone to the extent of thinking that Arundhati who was an epitome of a unique virtue of not obstructing the path of her husband would be too willing to expose a violation of this virtue committed by her and was pleased to reveal to the world that she is not what she is thought to be.

When Nilesh Oak completed the experiment of the ‘walking ahead’ of Arundhati in his simulation that he checked for every 1000 years, he was “*elated, exhausted and delirious*”. ¹⁹⁹

He concludes that chapter with a satisfactory note on his discovery of ‘*The Epoch of Arundhati*’ by comparing “ITS IMPORTANCE WITH DISCOVERIES OF COPERNICUS (GEOCENTRIC TO HELIOCENTRIC), KEPLER (CIRCULAR TO ELLIPTICAL ORBITS) OR GALILEO (CELESTIAL = TERRESTRIAL)”.²⁰⁰

His obsession making itself revealing too very often, Nilesh Oak’s choice of falsifiability criterion of Popper makes a **first rate case of evidence for Thomas Kuhn’s criticism** of this criterion that result is what one wants to see! Kuhn argues that “those holding different theories might report radically different observations, even when they both are observing the

¹⁹⁸Ibid. Page 54.

¹⁹⁹Ibid. Page 66.

²⁰⁰Ibid. Page 71.

same phenomena.”²⁰¹ WHEN ONE HAS THE END RESULT IN MIND AND WANTS TO PROVE THAT RESULT, THEN ONE WILL BE BEHAVING LIKE SCHOOL CHILDREN WHO WILL KEEP RE-DOING THE TESTS UNTIL THE EXPECTED RESULT APPEARS.

It is worth recalling here the words of Nilesh Oak quoted in the beginning, in the Introduction, expressing his obsession with A-V observation that *he was not at all keen on understanding or interpreting the other astronomy references unless the A-V observation is found to be true.*²⁰² Such obsession would somehow make one get to see it in some way and force-fit other references within that. This reminds us of the dialogue of Sherlock Holmes on the danger of hypothesis in non-statistical research: “*Never theorize before you have data. Invariably you end up twisting facts to suit theories, instead of theories to suit facts.*”

2. A-V observation is not a Basic Sentence in Popper’s criterion.

Karl Popper whose methodology of falsification Nilesh Oak claims to follow in his research sounds a specific caution in the matter of choosing a falsifier – in this case the A-V observation. THE FALSIFIER MUST BE A BASIC SENTENCE according to Popper.

*“Every test of a theory, whether resulting in its collaboration or falsification, must stop at some basic statement or other which we decide to accept. If we do not come to any decision, and do not accept some basic statement or other, then the test will have led nowhere...”*²⁰³

A Basic Sentence or Basic Statements are “*statements asserting that an observable event is occurring in a certain individual region of space and time.*”²⁰⁴

However Popper asserts that a basic statement

*“requires the consensus of the relevant scientific community—if the community decides to accept it, it will count as a basic statement; if the community does not accept it as basic, then an effort must be made to test the statement by using it together with other statements to deduce a statement that the relevant community will accept as basic. Finally, if the scientific community cannot reach a consensus on what would count as a falsifier for the disputed statement, the statement itself, despite initial appearances, may not actually be empirical or scientific in the relevant sense.”*²⁰⁵

The Basic sentence in Nilesh Oak’s research is the A-V observation which was rejected by everyone except Vartak as a true astronomy event. *By Popper’s theory this observation ceases to*

²⁰¹ “Karl Popper: Philosophy of Science – Criticisms of Falsificationism” <https://www.iep.utm.edu/pop-sci/#SH2c>

²⁰² “When Did The Mahabharata War Happen?” Page 57 - 58

²⁰³ Karl Popper: Basic Sentences and the role of Convention” <https://www.iep.utm.edu/pop-sci/#SH2c>

²⁰⁴ Karl Popper, “The Logic of Scientific Discovery” (English edition 1959), Page 85.

²⁰⁵ Karl Popper: Basic Sentences and the role of Convention” <https://www.iep.utm.edu/pop-sci/#SH2c>

be a Basic Sentence. In the absence of a consensus on the acceptability of A-V observation as a Basic sentence, there is no justification to treat it as a falsifier. Selective harping on falsification criteria without a consensus on the Basic Sentence is nothing but hypocrisy that does no proud to the name of Popper, whom he often quotes.

3. A-V observation is a subjective observation and not inter-subjective observation mandated by the theory of falsifiability.

Karl Popper is of the opinion that “*the objectivity of scientific statements lies in the fact that they can inter-subjectively be tested.*”²⁰⁶ KARL POPPER DOES NOT ACCEPT SUBJECTIVE OBSERVATIONS BUT ONLY THOSE OBSERVATIONS THAT ARE SEEN BY MANY. Writing on this, he says,

*“The event must be an ‘observable’ event; that is to say, basic statements must be testable, inter-subjectively, by ‘observation’. Since they are singular statements, this requirement can of course only refer to observers who are suitably placed in space and time.”*²⁰⁷

To explain this, the **universal statement** that “all swans are white” can be falsified by a single statement that “there is a black swan in the X country”. This **falsifier** comes from the observation of black swan in the X country. Suppose the observation was reported by Y, then it doesn’t qualify as a falsifier. That is, a statement “Y saw a black swan in the X country” is not a falsifier. Instead a statement that “black swans are seen in the X country” or “many have seen black swans” makes the statement a potential falsifier. The observation must have been made by many – or in other words ‘**inter-subjectively**’. Karl Popper has insisted on this important difference to make the observation a doubtless one.

But what has Nileshe Oak done? He has taken a subjective observation – an observation that was reported **only** by Vyasa. The A-V observation that Arundhati walked ahead of Vasishtha was not reported by anyone other than Vyasa. *A few days after this reported observation Bhishma from his arrow bed had remembered Arundhati and compared Sāndli with her.* Years before the observation by Vyasa, *Kunti had blessed her daughter-in-law to be like Arundhati.* Why didn’t these two people ever mention about Arundhati going in front of Vasishtha if the observation by Vyasa was universal. Moreover the context of their remembrance leaves no doubt about her position in the sky – i.e. behind her husband.

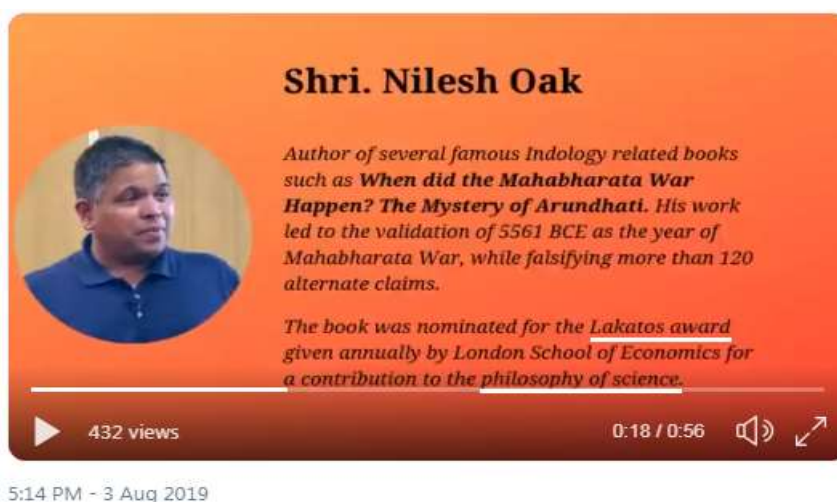
Picking out a theory of scientific inquiry is welcome, but one should do it within the norms given by that theory. The theory of falsification can work only when it is based on inter-

²⁰⁶Karl Popper, “The Logic of Scientific Discovery” (English edition 1959), Page 22.

²⁰⁷Ibid. Page 84.

subjective observation. *Karl Popper or any of his critics would straightaway reject Nilesh Oak's falsifier, the A-V observation*, for not fulfilling the criteria of inter-subjectivity.

Shockingly enough, this book of Nilesh Oak based on A-V observation as a falsifier was nominated for the **Lakatos Award** for the contribution to the Philosophy of Science, whose principal architect was Karl Popper.



Source: Nilesh Oak's tweet.

This is either a case of self-nomination or the nominators not knowing what Popper has said, or not having read Nilesh Oak's book fully from the perspective of Popper's falsification theory. Thankfully the Latsis Foundation²⁰⁸ spared itself of the embarrassment by not choosing this book for the award.

4. Inappropriateness of Popper's falsifiability as a methodology for proving A-V observation.

Karl Popper's methodology of falsifiability works on scientific theories for the purpose of progression of science. **Successful falsification of a theory leads to the birth of a new theory which again stands to test by falsifiers.** Thus there is continuous improvement in the field of science with experimental observations challenging the previous theories. Popper's choice of falsifier over verification arises from this fact, to give an example - Einstein's theory of relativity was successfully falsified by the observation of the bending of star light during solar eclipse. Any number of experiments on verification of Einstein's theory could not do what the falsification observation did to the success of the theory and furtherance of knowledge as a result.

²⁰⁸The Lakatos Award is sponsored by Latsis Foundation based in Geneva.

In contrast NILESH OAK'S A-V OBSERVATION IS NOT A THEORY, NOR DOES IT GIVE RISE TO ANY GROWTH OF SCIENCE ONCE FALSIFIED. Checking it at the Voyager simulator at best can be termed as **verification** – a process that Karl Popper was not keen on accepting as a potent way of proving a theory. As such Popper's methodology is irrelevant to testing the A-V observation. From what Nilesh Nilkanth Oak has done, it deserves to be called as **'Verification through Voyager software'** – with no scope to scientific claim or a falsifier of Popper kind.

5. Criticism of adhocism leading to manipulation.

Popper himself has conceded the criticism of his falsificationist methodology that it is liable for ad hoc changes to suit the results. Writing on this in his book he says,²⁰⁹

*".. it is always possible to find some way of evading falsification, for example by introducing ad hoc an auxiliary hypothesis, or by **changing ad hoc a definition**. It is even possible without logical inconsistency to adopt the position of simply **refusing to acknowledge any falsifying experience** whatsoever. Admittedly, scientists do not usually proceed in this way, but logically such procedure is possible; and this fact, it might be claimed, makes the logical value of my proposed criterion of demarcation dubious, to say the least."*

The highlighted ideas in the above quoted passage from Popper's book "The Logic of Scientific Discovery" are found to fit in two ways that Nilesh Oak has manipulated the astronomy references in Mahabharata.

(1) For proving his date of Mahabharata, *Nilesh Oak is found to give weird meanings to the very basic terms of astronomy and astrology*, such as retrogression / Vakri, pīdana / affliction and so on. There is a long list of Nilesh Oak's manipulations of astronomy positions given at the end of this book. As Popper says, scientists don't work this way; nor do historiographers or archaeo-astronomers.

(2) The other point is *his refusal to admit that A-V observation is only a nimitta* – which is a transient phenomenon and not an astronomy reference. Nilesh Oak refuses to accept that a nimitta is a not a falsifier for the astronomy nature of the A-V observation. He has argued severally in his blogs by sticking to a stance that nimitta is scientifically testable. This will be exclusively discussed in another chapter.

²⁰⁹ Ibid. Page 19-20

6. Falsification does not apply to astrological concepts.

The very basis of Popper's methodology of falsification is to enable one to draw a line between scientific and unscientific theories. Popper uses falsification as a criterion for demarcation between these two systems. He says,

*"The problem of finding a criterion which would enable us to distinguish between the empirical sciences on the one hand, and mathematics and logic as well as 'metaphysical' systems on the other, I call the problem of demarcation."*²¹⁰

If a theory is falsifiable, then it is scientific, if not, it is unscientific or pseudo-science. Karl **POPPER STRAIGHTAWAY REJECTS ASTROLOGY AS A PSEUDO-SCIENCE.** According to him subjects like astrology, metaphysics and Freudian psychoanalysis are "*not empirical sciences, because of their failure to adhere to the principle of falsifiability.*"²¹¹

The problem with the falsifier of Nilesch Oak, namely **THE A-V OBSERVATION IS THAT IT IS A NIMITTA WHICH IS PART OF ASTROLOGY.** In the very beginning of his conversation with Dhritarashtra, Vyasa says that he sees numerous omens (nimitta) indicating terror and starts listing them down, among which the A-V observation takes place. The Nimitta reference comes in the 16th verse,²¹² and from that begins a series of omens of which A-V observation comes in the 31st verse in the same chapter, in the same monologue of Vyasa.

Nilesch Oak has used an astrology concept as a falsifier for his 'scientific' dating of Mahabharata!

Behind the tall talk of scientific methodology in dating Mahabharata War trumpeted repeatedly by Nilesch Nilkanth Oak lies the hard fact that he has taken a Basic Sentence that Karl Popper could never accept as a falsifier!

Popper's theory is such that astrological references and astrological terms can never be categorised as science and therefore are not falsifiable (not testable). There is no use picking out a *nimitta* as a potential falsifier to build an entire theory. As an admirer of Popper, Nilesch Oak knows very well that he must keep a distance away from astrology. This is evident from his disclaimer-like statement in the Introduction of his book rejecting astrological explanations.²¹³

Wherever the traditional astrological terms such as 'vakri', 'pīdayate' etc., appear *he doesn't hesitate to hand out the weirdest interpretations in the name of scientific approach – his only*

²¹⁰ Ibid. Page 11

²¹¹ <https://www.britannica.com/biography/Karl-Popper>

²¹² Mahabharata: 6-2-16 <http://www.sacred-texts.com/hin/mbs/mbs06002.htm>

²¹³ "When did the Mahabharata War happen?" Introduction Page 2.

scientific approach being the use of Voyager Simulator to look at Direct Visual Astronomy on his proposed date. But ironically he had missed out the main context of the A-V observation that it is a Nimitta. It is evident that Nilesh Oak was not at all aware at the time of writing his book that the A-V observation was a nimitta. That word doesn't appear anywhere in his book.

It shows only one thing – that Nilesh Nilkanth Oak did only **selective reading of the Mahabharata text** for cherry-picking astronomy references! This reiterates the very first criticism given above (attributed to Thomas Kuhn) that he has seen what he wants to see – even from among the data available for research!

The Mother of Ironies

Nilesh Nilkanth Oak, the Popper follower, had not known for long that **Thomas Kuhn** was a severe critic of Karl Popper's theory of Philosophy of Science. This is proved by a slide tweeted by Nilesh Oak as recently as on 12th August 2019, in which he had Kuhn's name in the list of ideologues who contributed to his Vyapti-jnana. The slide (below) contains names of all texts and people whom he quotes as his source. Note Kuhn's name in that, but struck out in red.



The rejection of Kuhn must have come very recently for he is an odd man out in the slide. This strengthens the view that Nilesh Oak had come to know of the diametrically opposite stance of Kuhn against Popper very recently leading him to strike him out. When confronted with a tweeple why he had struck out Kuhn's name, Nilesh Oak replied that “*Because the first*

time I read it, none of it made sense & whatever little did was ‘trivially true stuff’. I made a conjecture (1993) that his work is useless, misleading and fraudulent.”



If fraudulent, *why did Niles Oak add Kuhn’s name in the first place in the list that he claims to contribute to Vyapti-jnana?* Would anyone keep the name of someone whose works were known to him right from 1993 as fraudulent? *Certainly this slide was not an old one prepared in 1993.* Between 1993 and 2019 there was enough time to correct the slide by dropping Kuhn’s name. By striking off Kuhn’s name in the already prepared slide, it has become more than obvious that Niles Oak had come to know only recently of the incompatibility of keeping Popper and Kuhn together as contributors of his Vyapti-jnana.

The inference is very simple – **THAT NILESH NILKANTH OAK DOES NOT ONLY SELECTIVE READING, BUT ALSO SUPERFICIAL READING.** He has not studied Popper fully, nor has he read Kuhn fractionally!

Chapter 7

METHODOLOGY: FAULTY CONCEPT OF PRAMANA

After publishing his book in 2011 incorporating the Epoch of Arundhati, Nilesh Nilkanth Oak has come up with two sets of methodologies in his blog one, the Triangulation formula of Karl Popper in October 2014²¹⁴ and another, sage Patanjali's sutra on *pramāna*, in January 2015.²¹⁵ One can find him explaining these two in his videos of recent years in support of his theory on Arundhati. It is quite natural to expect a writer to come up with newer justification for his theory long after publishing it. Strangely Nilesh Oak makes claims that contradict his own statement in the book besides contradicting the original meaning of the terms of the methodology he speaks about. An exposition of these contradictions reveals how shaky his interpretations are.

Is A-V observation a valid Shabda Pramāna?

This question arises after reading the views of Nilesh Oak on **Shabda Pramāna** in different platforms between 2011 and 2019. In his book he treats A-V observation as a Shabda pramāna. Writing on A-V observation in the chapter on “The Epoch of Arundhati” he says,

“This is an illustration of the validity of ‘Shabda Pramāna– Verbal Testimony’ corroborated by ‘Pratyaksha Pramāna – Empirical Proof.’”²¹⁶

Here he treats the sighting of Arundhati – Vasishtha by Vyasa as Shabda pramāna, and his own verification of the same in the simulator as Pratyaksha Pramāna.

In his 2015 blog he rejected Shabda as a pramāna in the context of explaining the sutra of Patanjali “**pratyakṣa-anumāna-āgamāḥ pramāṇāni.**” Unable to accept Agama as a pramāna, he figures out a scenario of misinterpretation of Agama, stating that

“anytime ‘Agama’ was misunderstood and was interpreted as ‘knowledge beyond doubt, scepticism or criticism’, humanity has landed in big trouble.”²¹⁷

²¹⁴“Tri-Murti of Scientific Method” <https://nileshoak.wordpress.com/2014/10/07/tri-murti-of-scientific-method/>

²¹⁵“Scientific Method: Elegant & Intricate” <https://nileshoak.wordpress.com/2015/01/11/scientific-method-elegant-intricate/>

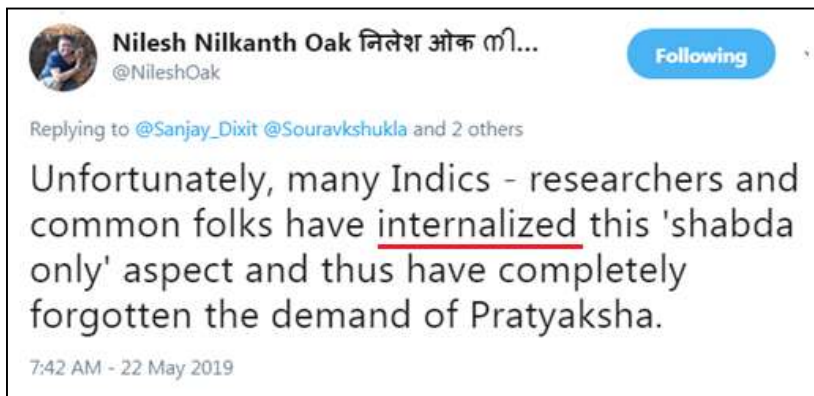
²¹⁶“When Did The Mahabharata war Happen?” Page 70

²¹⁷“Scientific Method: Elegant & Intricate” <https://nileshoak.wordpress.com/2015/01/11/scientific-method-elegant-intricate/>

He further says that Agama was modified into Shabda later and was twisted with an element of dogmatic insistence. To quote his own words,

“It appears that some of the Indian traditions modified Patanjali’s original ‘Pratyaksha-Anumana-Agama-Pramāna’ into ‘Pratyaksha-Anumana-Shabda’ as means of ‘Pramāna’....However the worst part of this twisting was their dogmatic insistence on Shabda (Authority-read-utterance/opinion of Gurus, Godmen, Teachers, Professors, elders) that, IMHO, led to Dark Age of Science in India.”

So according to him *Shabda replaced Agama and was twisted badly such that the Indian science was pushed into Dark Age*. This view of him seems to have grown exponentially over the years that recently in a twitter interaction Nilesh Oak was found to be spitting scorn over the very idea of Shabda Pramāna.



However his view recorded in 2017 was dramatically different from this, echoing his earlier insistence on A-V observation as Shabda Pramāna. One can read this in the transcript of his lecture given at Srijan Foundation, posted in a website.²¹⁸

*“So, now we bring all of this together and let us adorn our scientific hats. We have got our empirical proof; we have got the “**Shabda Pramaan**”, somebody’s claims. Arundhati walking ahead of Vasishtha, we got empirical proof? Yes, that indeed it went ahead of the Vasishtha.....*

*“....That’s fine ‘**Shabda Pramaan**’ matches with the ‘**Pratyaksha Pramaan**’, empirical proof that’s all nice but come on, that is just one observation.”*

Few months after this, in 2017, Nilesh Oak repeats the same idea of treating A-V observation as Shabda Pramāna in a crisp reply to Dieter Koch.²¹⁹

²¹⁸“AV Observation And The Date of Mahabharata Explained.”<https://indictales.com/2017/02/14/av-observation-and-the-date-of-mahabharata-explained/>

²¹⁹“Debating evidence, method & Inferences: Oak vs Koch – Part 3”
<https://nileshoak.wordpress.com/2017/05/22/debating-evidence-method-inferences-oak-vs-koch-part-3/>

Of course, AV observation stands in its glory and remains one of the best 'Shabda' pramana that is corroborated by 'Pratyaksha' pramana and fortunately this fact is not lost on Dieter Koch.

Now more recently in May 2019, in a twitter interaction he envisaged taking up Shabda Pramāna as a last resort when the other pramāna are not available.

mayank.awasthi @mayank2030 · May 3
 Replying to @NileshOak @VivekNSharma87
 shabd Pramana is weakest of all pramanas. Tark Shastra should be mandatory school curriculum
 1 5 8

Nilesh Nilkanth Oak निलेश ओक നീലേഷ് ഓക്ക് @NileshOak · May 3
 Thanks. Very few comprehend it. Also, what many don't know is that 'Shabda-pramana' is reached as a last resort when all other Pramanas are not accessible.
 Pratyaksha (Sakshatkar) is the highest Pramana and a road from Shabda to Pratyaksha is long, yet rewarding!

Nyaya sutra 1:1:3

प्रत्यक्षाऽनुमानोपमानशब्दाः "प्रमाणानि"

करण	व्यापार	फल
इन्द्रिय	सन्निकर्ष	प्रत्यक्षज्ञान
व्याप्तिज्ञान	परामर्श	अनुमिति
सादृश्यज्ञान	अतिदेशवाक्य स्मरण	उपमिति
पदज्ञान	पदार्थ स्मरण	शब्दबोध

3 7 10

Nilesh Nilkanth Oak निलेश ओक നീലേഷ് ഓക്ക് @NileshOak · May 3
 Recognize that 99.99% of Academics or researchers in general, do not go beyond 'Shabda-pramana'. That is how pathetic the situation is. And worse, there is no self-awareness and thus when pointed out, these 'fake experts' are offended (they pretend 'being offended' well).

Thus we find a changing stance on Shabda Pramāna.

2011 (book) – Accept Shabda Pramāna.

2015 (blog) – Reject Shabda Pramāna.

2017 Feb (lecture) – Accept Shabda Pramāna.

2017 May (Blog) – Accept Shabda Pramāna

2019 May-twice (Twitter) – Reject Shabda Pramāna.

The only common feature through all these is to accept Shabda Pramāna if it is about A-V observation. But Shabda Pramāna in general is rejected. This raises the following questions.

1. Having rejected the very idea of Shabda Pramāna summarily, how can he still hold on to the claim that A-V observation is the Shabda Pramāna validated by him?
2. Rejection of *Shabda Pramāna must hold good for all Shabda Pramānas*. By harping on A-V as Shabda even after this rejection, does he mean to accord an exception to A-V observation?
3. If A-V is special that he treats it as an exception, on what grounds he does that?
4. If Arundhati walking ahead of Vasishtha is a Shabda Pramāna, then what is the status of Arundhati walking behind Vasishtha that is continuing for aeons? Isn't Arundhati behind Vasishtha a Shabda pramāna, given the fact she is invoked in Vedic mantras precisely for this reason at Vedic marriages?
5. *Can two Shabda Pramānas exist for two facets of the same person / star – Arundhati walking ahead and Arundhati walking behind Vasishtha?*
6. These two being contradictory, *both (contradicting) statements cannot become Shabda Pramāna*. But one of them can be Shabda Pramāna. Did he analyse which of the two qualify to be a Shabda Pramāna?
7. At the least, *did he analyse the verse on A-V to check if it is qualified as Shabda?*
8. Taking up the analysis, let me reproduce the verse given by Nilesch Oak in his book. “My dear King, Arundhati (saintly wife of Vasishtha) who is revered by the righteous all over the three worlds, has left her husband Vasishtha behind.”²²⁰

This has two parts, appearing as two lines in the Sanskrit verse.

Line 1: My dear King, Arundhati (saintly wife of Vasishtha) who is revered by the righteous all over the three worlds, (the cause for the reverence is that Arundhati follows Vasishtha - **inter-subjective observation as per Karl Popper**)

Line 2: Has left her husband Vasishtha behind (*subjective* observation by Vasishtha).

As per Karl Popper's falsification method, the first line is a **Universal Statement** (much like “All swans are white”).

The second line is an **existential statement** (like “There is a black swan”)

To make the second line a Basic Sentence or falsifier, IT MUST HAVE BEEN SEEN BY MORE THAN ONE PERSON. In the absence of any reference to that effect, THE FIRST LINE CONTINUES TO BE UNCHALLENGED, remains a universal statement and therefore ONLY THE FIRST LINE IS VALID AS A ‘SHABDA PRAMĀNA’.

Can Nilesch Oak challenge this by Popperian methodology of falsification that he is fond of?

²²⁰“When Did The Mahabharata War Happen?” Page 53

9. On what basis Nilesch Oak treats the A-V verse as Shabda Pramāna – *because it was seen by Vyasa, or because it appears in Mahabharata, a text he assumes to be factual?*

10. If Nilesch Oak picks out the first among the two, raised in the 9th question, then it becomes the *Pratyaksha Pramāna (direct perception by Vyasa) and not Shabda Pramāna.*

That Vyasa had seen Arundhati going ahead of Vasishtha is his perception –

Pratyaksha Pramāna. The researcher has to check it with the next in sequence

namely; **Anumana** and then **cross check it with Shabda** – that is how the process of

research happens with Pramānas. But **why did Nilesch Oak go on the reverse –** **TAKING**

UP VYASA’S OBSERVATION AS SHABDA AND HIMSELF SEEING IT IN SIMULATOR AS

PRATYAKSHA?

Taking up the second in the 9th question, *will he accept everything in Mahabharata text*

as Shabda Pramāna? **IF YES, WHY DID HE CLING ON TO A NUMBER 98 THAT IS**

NOWHERE FOUND IN MAHABHARATA AS THE NUMBER OF DAYS BHISHMA WAS LYING

ON ARROW BED? *If his answer for the question is no,* **WHY SHOULD HE TREAT THE A-V**

OBSERVATION AS SHABDA PRAMĀNA as he himself has conceded in his book that *“it*

is reasonable to assume existence of transcription and transmission errors in the

Mahabharata text”?²²¹ A text with errors and doubtful transcript cannot be treated as

Shabda Pramāna.

Post his book release, Nilesch Oak’s **obsession with Pramānas** seems to have grown. A-V observation is Shabda Pramāna in his book, and on all the occasions he speaks or writes on A-V observation. Come other times, Nilesch Oak is up with various interpretations of Pramāna, forgetting every time that his newer definitions would contradict the Shabda Pramāna nature of A-V observation. So far he has talked about the Pramānas from **Yoga Sutra of Patanjali** and from **Nyaya Sutra** (in the tweet shown earlier). Mixing them with Karl Popper’s ideas he has created what can be called ‘**NILESH OAK SUTRA OF PRAMĀNAS**’. I tried my best to pick out the substance from them and present it below.

Nilesch Nilkanth Oak Sutra of Pramānas.

Sometime after he published his book, Nilesch Oak had come across Patanjali’s Yoga Sutras and found something dramatic in support of his methodology of how he arrived at A-V observation. He writes in his blog in 2015,²²²

²²¹“When Did The Mahabharata War Happen?” Page 14

²²² “Scientific Method: Elegant & Intricate” <https://nileshoak.wordpress.com/2015/01/11/scientific-method-elegant-intricate/>

“While reading Patanjali Yoga-Sutra, I came across a Sutra (Aphorism) and instantly realized that I had landed on more intricate and elegant scientific method”.

The sutra that attracted him is “*pratyakṣa-anumāna-āgamāḥ pramāṇāni*”

The above narration by Nilesh Oak gives an impression that he is new to the concept of Pratyaksha etc. pramānas until he read the Yoga sutras, although he was found to have used two terms ‘Pratyaksha’ and ‘Shabda’ pramāna in his book. It could also mean that he already knew the terms (or else he could not use them in the book) but had thought about them deeply only in 2015 when he was reading the Yoga sutras. And in his habitual way of interpreting terms in his own way (much like interpreting vakri, pīdana etc.) he re-interprets the sutra of Patanjali and declares,

*“I want to present **alternate explanation** for this Sutra that is further enriching and exhibits iterative and sophisticated view of acquiring knowledge.”*

The uniqueness of his interpretation is such that *he has made Pramāna, a generic term, a subset of itself*. To give a simple example, there is a triad, the **Tri-mūrti**: they are Brahma, Vishnu and Shiva. Now you state **the triad consists of Brahma, Vishnu and Tri-mūrti, how correct is it?** It is correct if we accept Nilesh Oak’s interpretation.

FOR NILESH OAK, THE PRAMĀNAS ARE PRATYAKSHA, ANUMANA AND PRAMĀNA!!

He strips off Agama from the triad of Pramānas given by Patanjali and forms what he calls a triangulation comparable with **Popper’s Triangulation** of Explanation-Prediction-Testing in which

Pratyaksha = Testing

Anumana = Prediction

Pramāna = Explanation.

Interestingly he has coined the term “**Tri-mūrti scientific method**”²²³ for the triangle he interpreted from Karl Popper. Though he compares Agama with background knowledge and assumptions, he prefers to set it aside from pramānas, as he thinks that *“anytime ‘Agama’ was misunderstood and was interpreted as ‘knowledge beyond doubt, scepticism or criticism’, humanity has landed in big trouble.”*

²²³“Tri-Murti of Scientific Method” <https://nileshoak.wordpress.com/2014/10/07/tri-murti-of-scientific-method/>

He justifies this treatment to Agama by citing how **Aristotelian science** turned into dogma leading to stagnation of growth. He also accuses some of the Indian traditions as having modified Agama into Shabda which resulted in dogmatic insistence of the authority of Gurus, Godmen, Teachers, Professors, elders. It is clear he has no respect for Shabda Pramāna – but that did not stop him from quoting A-V observation as Shabda Pramāna!

The contradictions don't stop here as we find **new interpretation for the pramānas** in his tweet from Nyaya Sutra, posted in May 2019. (Next Page).

As per the logic of Nilesch Oak, **PRATYAKSHA APPEARING FIRST IN THE LIST OF PRAMĀNAS IS THE HIGHEST PRAMĀNA AND SHABDA APPEARING LAST IN THE LIST IS THE LAST RESORT.** In other words, he gives **place value** for the three pramānas Pratyaksha, Anumana and Shabda appearing in this order. Applying this place value formula for the Tri-mūrti-s I started wondering how would he interpret the importance of the three murtis? Would he say that Brahma is the deity of highest importance and Shiva being the last in the list must be invoked only as a last resort or after reaching out to the first two?

Nilesch Nilkanth Oak निलेश ओक നീലേഷ് ഓക് @NileschOak · May 3
Thanks. Very few comprehend it. Also, what many don't know is that 'Shabda-pramana' is reached as a last resort when all other Pramānas are not accessible.

Pratyaksha (Sakshatkar) is the highest Pramāna and a road from Shabda to Pratyaksha is long, yet rewarding!

Nyaya sutra 1:1:3
प्रत्यक्षाअनुमानोपमानशब्दाः "प्रमाणानि"

करण	व्यापार	फल
इन्द्रिय	सन्निकर्ष	प्रत्यक्षज्ञान
व्याप्तिज्ञान	परामर्श	अनुमिति
सादृश्यज्ञान	अतिदेशवाक्य स्मरण	उपमिति
पदज्ञान	पदार्थ स्मरण	शब्दबोध

3 7 10

Nilesch Nilkanth Oak निलेश ओक നീലേഷ് ഓക് @NileschOak · May 3
Recognize that 99.99% of Academics or researchers in general, do not go beyond 'Shabda-pramana'. That is how pathetic the situation is. And worse, there is no self-awareness and thus when pointed out, these 'fake experts' are offended (they pretend 'being offended' well).

IN NILESCH OAK'S SCHEME, AGAMA AND SHABDA DESERVE TO BE ELIMINATED FROM PATANJALI'S YOGA SUTRA TO MAKE THEM MORE SCIENTIFIC. After he started reading **Nyaya sutra**, he seemed to have somewhat come to terms with Shabda Pramāna, but wanted to uphold Pratyaksha above Shabda and the placement order convinces him of the superiority of Pratyaksha over Shabda. However one cannot help thinking that **THIS LOVE FOR**

PRATYAKSHA OVER SHABDA MAY BE TO JUSTIFY HIS ‘DIRECT VIEWING’ OF THE A-V PHENOMENON THROUGH VOYAGER- SIMULATION WHICH HE PROMOTES AS PRATYAKSHA PRAMĀNA!

A model jingled with jargons.

In the final analysis, what Vyasa saw as Pratyaksha Pramāna, has been taken over by Nilesh Oak. Since Shabda Pramāna remains as a hindrance to his theory, it is conveniently given a clean burial. But whenever he has to talk about A-V observation, he is not able to resist the temptation of quoting it as Shabda Pramāna, for; **BY DOING SO HE THINKS THAT HE IS PROJECTING HIS RESEARCH AS IF IT IS IN TUNE WITH THE METHODOLOGY OF THE VEDIC CULTURE**. Or else why should a *research that depends on deriving the astronomy positions from astrology concepts of the ancient society* harp around huge verbosity of little use and the jargons of philosophy of science of Popper and metaphysics of Astika Darshanas?

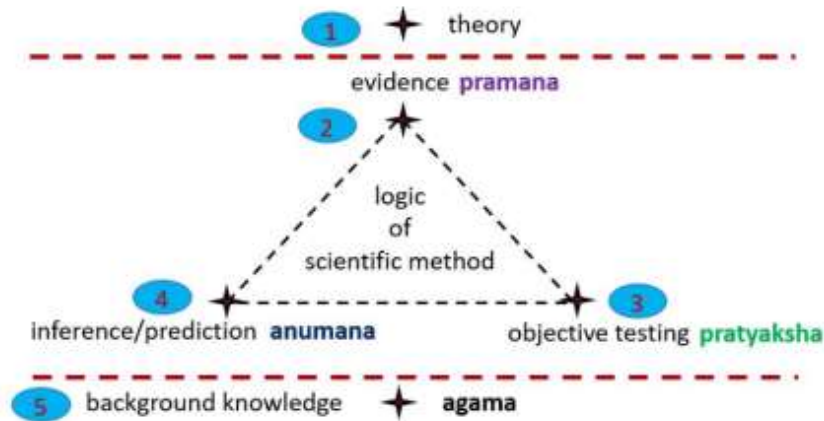
The worst ever part is his triangulation of Popper that shows he has not understood Popper either. Popper talks about dimensions of a theory in terms of geometric shapes in his chapter on Degrees of Testability in his book ‘**Logic of Scientific Discovery**’. According to him the degrees of testability of the Basic Sentences or the falsifiers can be compared on the basis of the **dimensions** that can be tested by the falsifier. The dimensions are determined by the **number of parameters by which a theory is represented**. The lesser the dimension, higher is the degree of testability.

Popper has listed out upto four dimensions to explain this idea. A triangle in this scheme represents two or three dimensions depending on whether it passes through three or two given points (in conical shape). A falsifier (Basic Sentence) of this type must possess three or two dimensions to test a given theory to prove it as either wrong or right. As per his scheme, a *triangle is two dimensional with three sides, with each side passing through two points*.

This purely belongs to the realm of science, and if someone wants to adapt it, he can do so by invoking Poppers’ name if there is some semblance to what he does. Nilesh Oak claiming to do scientific research invokes Popper’s name for the Triangulation he uses for the metaphysical concept of Astika Darshanas.

The following model is given in his blog (and repeated in his lectures) that

“It is important to comprehend the logic of scientific method in order to understand what is demanded of a scientific theory, how its consequences are calculated and how it is objectively tested with the help of evidence.”²²⁴



The name of Popper’s book, “The Logic of Scientific Discovery”, is adapted here as ‘logic of scientific method.’ The triangle is bounded between parallel lines on two sides with no Popperian logic of why such boundary is needed. The Agama is relegated outside and never used anywhere in his scheme. He recognises the 5 elements in this model as “5 key elements of the scientific method.” In his own words:

Here is the necessary information about my theory as it relates to 5 key elements of the scientific method:

1. All astronomy observations of the Mahabharata text are visual, actual, factual observations of the sky of the Mahabharata times.
2. All astronomy and associated observations from the Mahabharata text add up to 300+ and all of them must be objectively tested.
3. Objective testing was carried out with the help of mathematical calculations and/or astronomy simulations (e.g. Voyager 4.5)
4. Inferences (or corroboration for existing inference) were drawn based on triangulation of evidence via objective testing. Each piece of evidence was tested either individually or in a group (as appropriate) and the inferences were drawn based on logical reasoning.
5. The background knowledge includes modern astronomy, Indian astronomy, Luni-solar calendar, the precession of the Earth’s axis and proper motions of the stars.

There is nothing scientific about the first two elements. The 3rd is his only source of method used for his entire research. The 4th is about how he has fitted his ideas in a framework. The 5th is available in simulator and the catalogues. In the place of just saying that he used the

²²⁴On the chronology of Mahabharata War: 5561 BCE vs 3067 BCE – Part 3
<https://nileshoak.wordpress.com/2018/09/13/on-the-chronology-of-mahabharata-war-5561-bce-vs-3067-bce-part-3/>

simulator to note down the planetary positions around the time of his date of Mahabharata war, *he has spun scientific semblance from Popper and Vedic semblance from Pramānas!*

Having seen what Nilesh Oak has proposed, isn't it time we know what Vedic culture tells about Pramānas?

Pramāna is source of Knowledge.

Nilesh Oak defines Pramāna “in the current context (scientific method) as ‘Insight’ or ‘Explanation’, instead of merely ‘proof’, ‘evidence’ or ‘testimony’.”²²⁵

Vedic scholar **R. Ramanathan** derives the ETYMOLOGY OF PRAMĀNA as ‘ma’ meaning measurement, when joined with the prefix ‘pra’ meaning ‘emanating from’, becomes prama, meaning ‘emanating measurements’. With pratyaya added, it becomes Pramāna, meaning “knowledge emanating from something”.

From **Vatsyayana Bhashya** of **Gautama Nyaya Sutras**, he quotes that Pramāna means “**Source of knowledge**” for the sutra quoted by Nilesh Oak in the tweet given earlier. The sutra runs as “*Pratyaksha anumana upamana shabda: Pramanani*” (Nyaya Sutra 1.1.3).

As per Vatsyayana Bhashya for this sutra:

Carvakas admit only Pratyaksha (perception);

Vaiseshikas and **Bauddhas** admit two (Perception and Anumana / inference);

Sankhyas admit three (perception, inference and agama / shabda / verbal testimony);

Naiyayikas admit four (above sutra: perception, inference, Upamana / comparison and verbal testimony);

Prabhakaras admit five (previous four + presumption / arthapatti);

Bhattas and **Vedantins** admit six (previous five + abhava / non-existence);

Pauranikas admit seventh and eighth (previous six + sambhava / probability + aithihya / rumour).

All these eight are Pramānas (Pramānani) or sources of knowledge forming the basis of the works of different schools. ONLY THOSE WORKS THAT FOLLOW A MINIMUM OF THE FIRST THREE NAMELY PRATYAKSHA, ANUMANA AND SHABDA / AGAMA ARE RECOGNISED AS ASTIKA DARSHANAS or Astika works. This conveys the following:

²²⁵“Scientific Method: Elegant & Intricate” <https://nileshoak.wordpress.com/2015/01/11/scientific-method-elegant-intricate/>

- By having rejected Shabda / Agama, Nilesh Oak has reduced his much laboured work – laboured to prove that he is following Vedic methods – into **nāstika** or non-Vedic work!
- By making Pratyaksha Pramāna as the primary and the only pramāna, Nilesh Oak has made his research fit to be called as “**Carvaka**” work.
- By embracing a methodology of Pramānas with twisted meaning of Pramāna by making it a sub-set to itself, Nilesh Oak has set the tone of his research – **of ignoring the established meanings of the terms of Mahabharata** and twisting them as he likes. E.g.: Vakri, Pīdana.
- By merging the lofty concept of Pramānas with Popper’s Triangulation (that is however inferior to modern Flow chart models of scientific research in sociological studies that include history.²²⁶), Nilesh Oak has **undermined the scope of Pramānas**

To quote an example, *Popper does not recognise the role of negation as a Basic Sentence* which however is one of the sources of knowledge (pramāna). The following view of him shows the limitations of his methodology.

“A statement of the form ‘There is a so-and-so in the region k’ or ‘Such-and-such an event is occurring in the region k’ (cf. section 23) may be called a ‘singular existential statement’ or a ‘singular there-is statement’. And the statement which results from negating it, i.e. ‘There is no so-and-so in the region k’ or ‘No event of such-and-such a kind is occurring in the region k’, may be called a ‘singular non-existence statement’, or a ‘singular there-is-not statement’. We may now lay down the following rule concerning basic statements: basic statements have the form of singular existential statements.”²²⁷

It is a fact that the ‘Singular non-existence statement’ (or *there-is-not* statement), not recognised by Karl Popper is very much part of the Pramānas of the *Astika Darshanans*. Such statements have a parallel in the concept of ‘*Anupalabdhi*’, the 6th pramāna among the eight narrated by Vatsyayana and followed by Vedantic schools of Thought. A non-existence statement such as “*There are no stars in the sky*” pre-supposes that there were stars in the sky but not apprehended at the time of looking at the sky. It also gives the knowledge that the statement was uttered in the day time! *Sometimes non-existence conveys existence, and non-perception is perception*. Such kinds of expressions are found in Mahabharata astronomy terms – which cannot be deciphered by a Popperian follower. The Indian system of Pramānas is

²²⁶C.R. Kothari, (2004) “Research Methodology: Methods and Techniques” New Age International Publishers, New Delhi, Page 11

²²⁷Karl Popper, “The Logic of Scientific Discovery” (English edition 1959), Page 83

undoubtedly far superior source of knowledge and need not be mixed with Popper's philosophy of science to sanctify it as scientific.

Did Arundhati walk ahead of Vasishtha? -Mimamsa explanation

The A-V observation verse by Vyasa is a **two-liner** incorporating two ideas of conflicting nature. The **first line praises Arundhati** as one '*who is celebrated over the three worlds and is applauded by the righteous*' (Ganguli translation). The cause for this reverence, though unstated in the verse is obviously for her status as one who never obstructed the path of her husband. Only when this is taken as the cause for this statement, the reference in the second line of keeping her husband in her *prishtha* makes sense.

Thus we have *two contradictory statements* given by no less a person than Vyasa in the context of an important observation of the surroundings around him. The entire verse can be taken as **Shabda pramāna or Apta vacana**, as the deliverer of the verse is a person of high stature. Of these two statements, *Nilesh Oak has concentrated only on the second one and failed to consider the relevance of the Shabda nature of the first statement.*

Among the different *Darshanas*, the **PURVA MIMAMSA** is known for advanced thought processes in solving paradoxical and contradictory passages. When two *Pramānas* with contradictory connotations are observed for the same frame of inference, the logical way to solve it is to apply Mimamsa axiom of **GUNAPRADHANA** wherein *Guna means subordinate and Pradhana means principal*. This axiom has been used by the Indian judiciary in interpreting contentious clauses.

Gunapradhana axiom states that

*"if a word or sentence purporting to express a subordinate idea clashes with the principal idea, the former must be adjusted to the latter, or must be disregarded altogether."*²²⁸

In the verse by Vyasa, Arundhati praised in all the three worlds by the righteous people is the **Pradhana statement**. The applause was for not obstructing the path of her husband by crossing his way or moving in front of him. The same Arundhati perceived as having put her husband at her back is **Guna statement** as *that was reported only at that time or seen only at that time*. **NEVER BEFORE OR NEVER AFTER ANYWHERE IN THE TEXT OR BY VYASA HIMSELF, THE SECOND FEATURE OF ARUNDHATI HAD EVER BEEN REPORTED OR RECORDED.**

²²⁸"The Mimamsa Principles of Interpretation" by Justice Markandey Katju <http://www.ebc-india.com/lawyer/articles/93v1a4.htm>

So the second statement being Guna in nature has to be read as **not disrupting the former (Pradhana)**— meaning to say that Arundhati was not seen putting her husband at her prishṭha by others, but only by Vyasa – which is possible if it happened for a short period of time – not long enough to get to be noticed by others.

Secondly, when Guna does not match with Pradhana, such an observation (Guna) is fit to be discarded as an **aberration**.

In both cases, the Guna statement is not to be taken as true or tenable. It must be noted here that another kind of Guna nature of Arundhati is also reported in Mahabharata in another context which however was discarded by the speaker in that context – precisely for the reason of the Guna mismatch with Pradhana. That incident will be discussed in the next chapter in the context of nimittas.

For the verse under discussion now, it can be said, that **AS PER THE LOGIC OF PURVA MIMAMSA, THE REFERENCE TO ARUNDHATI KEEPING HER HUSBAND AT HER PRISHṬHA IS NOT FACTUAL.**

Did Arundhati walk ahead of Vasishtha? – Pramāna based interpretation.

The fundamental pramānas are three – Pratyaksha, Anumana and Shabda. Nilesh Oak's contention that Shabda Pramāna has been internalised and Pratyaksha Pramāna is forgotten, is not correct because the state of inquiry is such that it is a three-some process starting from Pratyaksha, and passing through Anumana, finally getting ascertained by Shabda. To give an example,

I see smoke at a faraway place. This is **Pratyaksha**.

I guess that there is a fire there. This is **Anumana**. But I cannot know anything more than the fact that there is fire - whether it is accidental or deliberately made for disposing junk. Only Shabda will let me know what kind of fire it is.

I read the news next day that an accidental fire had happened. This news report is the **Shabda**.

So, Pratyaksha may be dubious (the smoke may be from a kiln or a homa); Anumana can be many; but only Shabda is factual.

Only by referring to Shabda can we know the right status of knowledge even though the Pratyaksha may have been done by us.

Therefore his criticism that the academics do not go beyond the Shabda Pramāna is ill-founded, for, no one can go against the Shabda Pramāna, not because someone said so but because the basis of Shabda is unassailable.

In the case of Arundhati, all the features of the **symbolism of Arundhati** given in the 1st chapter form the solid base for **Shabda Pramāna** for her stature. When a reference is made that Vyasa had sighted a deviation in her position, no academic in the know of ancient wisdom would take it as a permanent or a prolonged (certainly not for 6000 + years as Nilesh Oak claims) appearance, for, in such case the deviation would have been recorded in some text and a prolonged deviation would have dislocated the symbolism of Arundhati and dislodged her by now from the marriage ritual. When none of them have happened, the claim that the deviation was tested or corroborated by ‘Pratyaksha Pramāna’ by a present day researcher is ridiculous, for, *the deviation was the Pratyaksha – or direct perception of Vyasa, not the present day researcher, in this case, Nilesh Nilkanth Oak.*

The Nyaya Sutra cited by Nilesh Oak in his tweet is implicit in saying that Pratyaksha is not completely true. The explanation for that verse says that the **Kārana** is *Indriya* and **Vyapara** is *sannikarsha* which means the cause is the sense organ and the function is approximation. The cause in A-V observation was the sense organ of Vyasa and he has recorded what he perceived. Any perception is a sensation that modern psychology treats as gestalt²²⁹ which a Nilesh Oak or anyone else cannot claim to have seen by oneself by running a simulator.

A perception is a psychological interpretation of the *rupa* (form) and *jati* (structure or generic character) that could be determinate (*nirvikalpa*) or indeterminate (*vikalpa*). The three-some inquiry then demands the inquirer to go through the process after having perceived a form. Vyasa had done that and given his final understanding in that verse itself.

In his verse, *Pratyaksha and Anumana are merged together* – that is, on seeing some deviation (indeterminate perception) in the position of Arundhati, Vyasa inferred (Anumana) that Arundhati had kept her husband at her prishṭha. That is in the second line.

This is followed by **Upamana** – comparing what he saw with her generic position which blends with Shabda that she is a praiseworthy person for never deviating from her path. **THE UPAMANA BLENDED WITH SHABDA WAS REMEMBERED BY HIM IN THE FIRST LINE FOLLOWED BY WHAT HE SAW AND INFERRED (PRATYAKSHA AND ANUMANA).** The sequence of the ideas in the verse – of Shabda coming ahead of his Pratyaksha-Anumana statement conveys that a

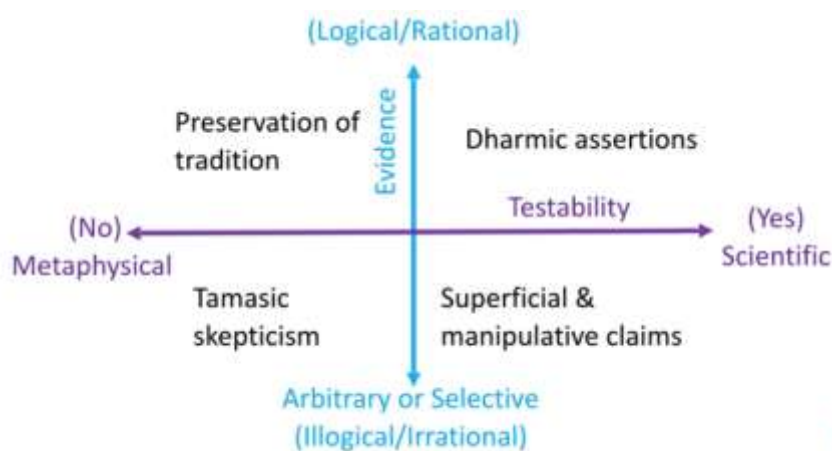
²²⁹Gestalt Psychology https://en.wikipedia.org/wiki/Gestalt_psychology

quick analysis was done in his mind by thinking of *Shabda vacana* or else he would not have brought first, her unwavering position for which she is praised, before expressing what he inferred from seeing.

This can happen, i.e. cross checking with the *Shabda vacana* and invoking the same to clear his mind of what he perceived - if what he saw lasted for a **short duration**.

On the contrary if it is true that Arundhati had been going ahead of Vasishtha for thousands of years before Vyasa's times as claimed by Nilesh Oak, *there is no in logic in recalling her generic position which Vyasa had never seen in his life time*. A configuration that had been in existence for more than 5000 years before Vyasa's times would have come to be accepted as a regular position and there is no place for comparative (first) statement in that verse. Vyasa should have just said that Arundhati in front position is bad.

Now the question arises how relevant is the claim of Nilesh Oak that **testable evidence is a Dharmic assertion**? He projects the following diagram in most of his talks on the 'Epoch of Arundhati' with the claim that the A-V observation was tested by him and therefore scientific and Dharmic.



This assertion raises the following questions:

- Does testability mean **testing through simulator only**, and not through other means such as Pramāna based logic?
- If the evidence of A-V observation is true as per his tests and therefore a Dharmic assertion, what would he call **the phase of Arundhati behind Vasishtha** – as *Adharmic assertion*?
- As per the above model he can successfully test Arundhati behind Vasishtha in other times, for e.g. at current times and claim it to be **scientific and Dharmic assertion**.

- Two different positions of the same one at two different times may be true and scientifically testable, but **what makes those statements Dharmic?** *Is testability a measure of Dharmic nature?*
- By claiming scientific testability a criterion for a statement to be Dharmic, is he not **ignoring** the crucial inner meaning of the statement on whether or not it is Dharmic? (The inner meaning is that Arundhati had crossed the path of her husband which is against her own assertion of her tapas and her dharma.)
- Or shall we claim that Nileshe Oak has **re-defined the meaning of Dharma**, much like how he did for Vakri, Pīdana etc.?

Vyasa reports deviation in the Pole star too.

Arundhati was not the only star that his vision seemed to tell him that she deviated from her position. Even the pole star was seen by him as having moved in the opposite direction! Among the nearly **78 omens (nimitta)** expressed by him in chapter 2 and 3 of Bhishma parva, he makes reference to the reversed appearance of only two stars – one is Arundhati and the other is the Pole star!

“dhruvaḥ prajvalito ghoram apasavyaṁ pravartate”²³⁰

The pole star, blazing fiercely had made an ‘*apasavya*’ movement at that time. This movement must have been apparent, not actual or temporary and not permanent because it **IS IMPOSSIBLE THAT THE POLE STAR HAD DEVIATED TO ITS RIGHT FROM ITS TRUE POSITION, TO BE PERCEPTIBLE FOR ONE TO NOTICE THE DEVIATION**. This apparent deviation has been noticed by the same observer (Vyasa) around the same time in the same part of the sky where he noticed Arundhati also deviating from her position. Similar on the lines of expressing A-V observation, Vyasa could have expressed his anguish at why a star that is fixed as a pole moved from its place. Perhaps the Pole star observation coming after A-V observation might have convinced him of what is happening around him and hence made him just mention the observation.

These two stars (Arundhati and the Pole star) are located in the same part of the sky but little away from each other. These two stars (Arundhati as part of entire Sapta Rishi Mandala) always move in anti-clockwise direction. **By saying that the pole star had moved in the opposite direction, i.e. clockwise**, it becomes logically acceptable that **he had seen some change in the positional alignment of the binary (Arundhati – Vasishtha) too leading him to**

²³⁰Mahabharata: 6-3 -16

make the statement that Arundhati kept her husband at her prishṭha. An observation of changed position of three stars (pole star and the A-V binary) in the same part of the sky could only refer to an *apparent movement and not actual movement*!

- Can Nilesch Oak figure out how the pole star also changed direction – and moved in clockwise direction?
- If his fascination for Arundhati reference led him find out a time period for her changed appearance in the simulator and backed up by a graph of Right Ascension Delta, what explanation has he for the changed direction of the Pole star?

Instead of looking into the probable reasons behind the deviation in the location of the pole star, Nilesch Nilkanth Oak has demonstrated where he stands when it comes to understanding astronomy references. He does speak about the deviation in the pole star – not from the text – but ‘*for fun and hypothetical exercise*’ to ridicule **Prof R.N.Iyengar** who chose to interpret both Arundhati and pole star deviation together in a verse.²³¹ I have not read Iyengar’s work but I see defects in the way Nilesch Oak has chosen to interpret the two sightings.

- First of all Nilesch Oak says that the **two observations appear in two different chapters** of Mahabharata (Adhyaya 2 and 3) and are unrelated.²³² He thinks that “*such a combination (is) is neither required nor justified*”²³³.
- This shows his **ignorance** of the context, because the two chapters cover the entire narration of the nimittas by Vyasa. The narration begins in the 2nd chapter and ends in the 3rd chapter. All the sightings of nimitta narrated here pertain to a specific time period within which all the other nimitta sightings including the A-V sighting and the sighting of the pole star had happened.
- This also shows that Nilesch Oak has **failed to see the similarity between the two** observations coming from the same part of the sky and almost at similar visual height
- There is yet another nimitta given by Vyasa in the same narration, from the same location of the sky that the *Sapta Rishi mandala looked dimmed*.²³⁴
- And the dimmed appearance of Sapta Rishi Mandala is reported along *with two planets that were rising with their crest seeming to burn in copper-reddish colour*!

²³¹ “When Did The Mahabharata War Happen?” Page 57

²³² Ibid. Page 57

²³³ Ibid. Page 69

²³⁴ Mahabharata: 6-3-24 <http://www.sacred-texts.com/hin/mbs/mbs06003.htm>

- On reading this verse, a person of scientific acumen would get a streak of thought on SPECTRAL REFRACTION of the rising planets near the horizon when the Sapta Rishi Mandala was already in the sky.
- But Nilesch Nilkanth Oak boasting of teaching scientific acumen to Indians through his research ignores this, for, he can test and corroborate only those verses that can be seen by him in his simulator! Nilesch Oak made no attempt to explore the scientific causes behind these appearances **or any single cause** that can give rise to all these appearances simultaneously. (The appearances are deviation of the Pole star to the right, deviation of Arundhati, the red crest of two planets and dimmed appearance of the Sapta Rishi Mandala)
- The pole star reference is given in the midst of astronomy references that Nilesch Oak has chosen to interpret in the 7th chapter of his book. *Why did he leave out the pole star reference alone?*
- Is it because he **could not simulate** it in the Voyager software?
- Does it mean that those that cannot be simulated can be **left out of scientific purview**?
- Why couldn't he think that *A-V observation too cannot be simulated* if it had appeared momentarily like the pole star that deviated to its right?
- Suppose the A-V binary were in the normal appearance with Vasishtha ahead of Arundhati, the same scientific reason that caused the pole star move to its right would also cause Vasishtha and Arundhati to move to their right, causing a change in their alignment.
- Why didn't Nilesch Oak awaken his scientific acumen **to explore this possibility**?
- But what does he say for the simultaneous deviation of the Pole star and the A-V binary? Poking fun on R.N.Iyengar for combining the two in a single verse, he creates a hypothetical observer of the Mahabharata times interpreting the deviations of the two (Pole star and A-V). In his words,
 "An observer, noticing *Arundhati* walking ahead of *Vasishtha* (who otherwise was walking behind *Vasishtha*) may visualize the celestial North Pole (and North Pole Star **if there was one available**) blazing and fiercely moving in reverse direction, as an explanation for the miraculous walking of *Arundhati* ahead of *Vasishtha*!"²³⁵
 (Emphasis mine)

²³⁵ "When Did The Mahabharata War Happen?" Page 69

- He further says that this hypothetical exercise should not be taken seriously but his explanation for A-V observation is corroborated by R.N.Iyengar's version.
- Why name Iyengar, when **VYASA HIMSELF HAS REPORTED SEEING ARUNDHATI 'AHEAD' OF VASISHTHA?** *Vyasa also reported seeing the pole star move to the right.* He didn't 'visualize' it as Nilesch Oak visualises in his hypothetical exercise.
- Strangely Nilesch Oak had succinctly **admitted** that there was no star at the polar point (of his date).
- **How then did Vyasa report of having seen the pole star deviating** from its position blazingly??
- What explanation Nilesch Oak has for that observation of Vyasa?

The solid fact is that there was no noticeable star at the polar point in Nilesch Oak's date of Mahabharata War. But none can deny the fact that Vyasa did see the pole star wheeling to its right with blazing brilliance.

- *Can Nilesch Oak locate the pole star for his date of Mahabharata War?* He has not bothered to check it anywhere in his book as he did not treat the pole star deviation as an astronomy reference.
- *Only if it is 'testable' in his simulator, it can get the stamp of approval* from him as an astronomy reference!
- The Dhruva was only an assumed centre at that time, but *Vyasa refers to fiercely glowing Pole star* having made an opposite movement.
- Assuming that the nearest to the Pole (NCP) could have been treated as the Pole star, we are faced with not one but two stars competing to be the pole star for Nilesch Oak's date. One was *Asellus Primus* (Theta Bootis) at a declination of $+82^{\circ}04'38.6''$ and another, *Edasich* (Iota Draconis) at $+83^{\circ}16'12.2''$. Which of these two could have been treated as a pole star by Vyasa if he existed in 5561 BCE as per Nilesch Oak's scheme?

The **APASAVYA MOVEMENT OF THE POLE STAR REPORTED BY VYASA GIVES A NEW FRAME OF ANALYSIS FOR THE A-V OBSERVATION** – something that Nilesch Oak has completely remained unaware of. *The deviation in the position of the pole star being transitory in character, the deviation of Arundhati noticed around the same time falls within the scope of scientific causes for such momentary deviation.* Only such transient appearances are recognised as Nimitta. A reading of the book of Nilesch Oak shows that he has hardly given any thought about the A-V observation being a nimitta. He has not even cared to derive the exact meaning of the word

Prishṭha in the A-V verse – a word that holds the key to the actual position of Arundhati in relation to Vasishtha in the binary alignment. In addition to these two, his faulty understanding of the connection between the start of Kaliyuga to the Mahabharata date is also being discussed in the upcoming chapters.

Chapter 8

NILESH OAK'S FAULTY UNDERSTANDING OF PRISHṬHA

To make his research 'scientific', Nilesch Nilkanth Oak followed the concept of falsification of Karl Popper and picked out A-V observation of Vyasa as his Basic Sentence. Any potential falsifier, taken as a Basic Sentence must be devoid of error, bias and misrepresentation or multiple meanings. Also a sentence having doubtful meaning or uncertain meaning cannot become a potential falsifier. In the case of scientific data, there is a likelihood of a measurement error, theoretical bias or observation not being accurate. But in the context of Nilesch Oak's research on the date of Mahabharata War, the data coming only from the literary source, the focus should be around context, syntax and semantics of the words used.

Having taken A-V observation as his Basic Sentence, Nilesch Nilkanth Oak paid no attention to the context of the observation and the semantics of the verse, with the result his research is found woefully wanting in scientific nature. His research suffers from two defects – one on semantics and the other on context. The first one arises from his faulty understanding of the word prishṭha and the second from absence of understanding of the context, namely nimitta.

Meaning of “prishṭha” (पृष्ठ) in the A-V observation not established.

Never once in his book Nilesch Oak analyses the Basic Sentence (the A-V verse of Mahabharata) in the light of what the Sanskrit words of the verse convey. He only gives the meaning of the entire verse²³⁶ without even quoting the source of that meaning. The meaning he has given is,

“My dear King, Arundhati (saintly wife of Vasishtha) who is revered by the righteous all over the three worlds, has left her husband Vasishtha behind.”

The verse in Sanskrit is as follows:²³⁷

या चैषा विश्रुता राजंस तरैलोक्ये साधु संमता

अरुन्धती तयाप्य एष वसिष्ठः पृष्ठतः कृतः

²³⁶“When did the Mahabharata War happen?” Page 53.

²³⁷Mahabharata: 6-2-31

[yā caiṣā viśrutā rājāṃs trailokye sādhu saṃmatā
arundhatī tayāpy eṣa vasiṣṭhaḥ **prṣṭhataḥ kṛtaḥ**]

The crucial word to be deciphered is “*prṣṭhataḥ*.” Nilesh Oak takes it to mean ‘behind’ in the beginning of the chapter on The Epoch of Arundhati but goes on to say ‘front’ or ‘ahead’ throughout the book. ‘*Prishṭha*’ has many meanings such as base, support, carrier etc. But what does it mean in the context of the two stars in this particular verse? Nilesh Oak has not addressed this basic question. Nilesh oak had **failed to establish the meaning of the word** clearly and decisively before declaring the verse to be a falsifier.

One who boasts of following Karl Popper should not be casual to the Basic sentence and yet claim his research as scientific! Scientific methodology calls for sifting through all the data in the text but why did Nilesh Oak fail to check with a similar expression elsewhere in the same text of Mahabharata?

The same word appears in the context of Sapta Rishi Mandala at another place in Mahabharata.²³⁸

“saptarṣīṇaṃ **prṣṭhataḥ kṛtvā** yudhyerann acalā iva
anena vidhinā rājāṇ jigīṣetāpi dur jayān”
सप्तर्षीणपृष्ठतःकृत्वायुध्येरन्नअचलाइव
अनेनविधिनाराजत्रजिगीषेतापिदुरजयान

The above verse says (in Ganguli’s translation²³⁹),

“**Keeping the constellation called Ursa Major behind them**, the troops should fight taking up their stand like hills. By this means, one may vanquish even foes that are irresistible”

To know what is conveyed in this verse by ‘behind’, let us read the succeeding verse. It says,²⁴⁰

“yato vāyur yataḥ sūryo yataḥ śukras tato jayah
pūrvam pūrvam jyāya eṣāṃ saṃnipāte yudhiṣṭhira”

Meaning by Ganguli:- “The troops should be placed in such a position that the wind, the sun, and the planet Sukra should blow and shine from **behind** them.”²⁴¹

²³⁸ Mahabharata: 12- 101-16 <http://www.sacred-texts.com/hin/mbs/mbs12101.htm>

²³⁹ Mahabharata 12-100 <http://www.sacred-texts.com/hin/m12/m12a099.htm>

²⁴⁰ Mahabharata: 12-101-17 <http://www.sacred-texts.com/hin/mbs/mbs12101.htm>

²⁴¹ Mahabharata: 12-100 <http://www.sacred-texts.com/hin/m12/m12a099.htm>

The word used is ‘**Purvam Purvam**’ to indicate something earlier – to mean that which is farther behind. This sounds perfectly logical, thinking of how each of the factors mentioned in the verse could help in the battle. The wind blowing from the back is highly conducive for victory, for it increases the momentum of the arrows shot.

The sun shining at the back of an army helps in two ways. The light of the sun mars the vision of the opponent in aiming his shots. It is also possible for the army to create illusions with the sun at the back. The phenomenon of sunset created by Krishna to delude the Kaurava army on the 14th day of war followed by the sudden re-appearance of the sun became possible by keeping the Sun at the back. **THE ARMY HAVING THE SUN AT ITS BACK CAN HAVE AMPLE SCOPE TO CREATE ILLUSIONS AT THE BACK OF ITS TROOPS TO DECEIVE THE OPPONENT FACING THE SUN.** The sun can be hidden by dark smoke and made to re-appear by dispelling the smoke. All these deceptions can happen at the back side of the army without leaving any hint to the opponent fighting in front of it.

The last in the order is Venus, which according to an astrological dosha called **“PRATI SHUKRA BHAUMA BUDHA DOSHA”**, if located in the west one must not go southward.

Appearance of Venus in the west happens in the evening, after sunset. This concurs with the earlier description of sun in the west. The army wishing to be victorious must hold the opponent in the east and south. The opponent seeing Venus in the west would avoid moving towards south as the battle progresses. So he will try to move towards north. But *by keeping the Sapta Rishi Mandala at the back, the successful army can push the opponent to the south.*

South is always associated with death.²⁴² An army that is getting pushed towards the south would also lose the morale. So it makes better sense for an army to keep the Sapta Rishis at its back for a psychological victory.

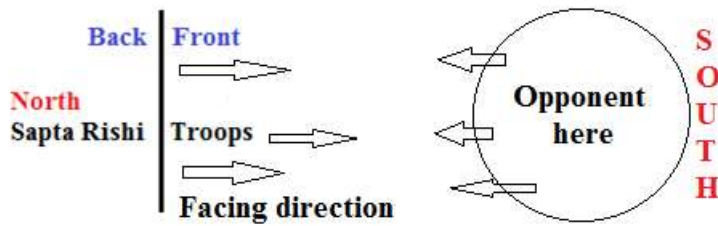
On the first day of the war, Mahabharata describes that the Pandavas were facing the east and had kept Venus and Vayu at their Prishṭha - *“śukro vāyuh **prsthatah** pāṇḍavānām”*²⁴³ This again reiterates the meaning of Prishṭha as back or behind.

The verse on keeping the Sapta Rishi Mandala at the Prishṭha also conveys a clear message of ‘at the back’. This should not be interpreted to mean ‘front’ -that the troops are moving in ‘front of’ the Sapta Rishis. If it is said so, then it would mean both the armies are moving in front of the Sapta Rishi mandala. This is true for both the armies but irrelevant for a statement that the Sapta Rishi mandala must be kept at the *prishṭha*.

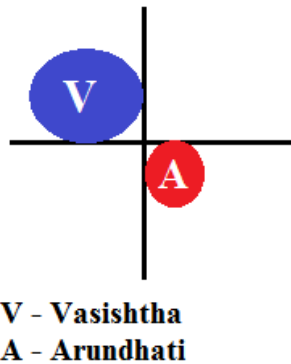
²⁴²Valmiki Ramayana: 5-27- verses 25, 28, 30

²⁴³Mahabharata: 6-20-6 <http://www.sacred-texts.com/hin/mbs/mbs06020.htm>

Vedic scholar **R.Ramanathan** says that the word *prishṭha* is used to mean ‘back’ in a number of Vedic passages.²⁴⁴ But *never was this word used to convey that something was in the ‘front’ or ‘ahead.’* So the relevant meaning in the context of keeping Sapta Rishis at the *prishṭha* is ‘at the back’ or ‘behind.’ What is front and what is back is within the reference frame of the alignment of the two players under consideration. The following figure shows the position of Sapta Rishis at the ‘back of’ the troops. The front of the troops is facing south while its rear is facing exact north, which is made out from the expression that the Sapta Rishis are kept at the *prishṭha* of the troops.



Applying this understanding to the verse of A-V observation, let us first see the current alignment between Vasishtha and Arundhati.

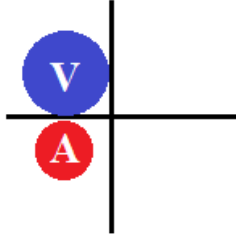


Two lines are drawn intersecting each other in which the horizontal line demarcates the front and back position. Arundhati is at the back of Vasishtha in the above figure, though towards the right side of Vasishtha. The same position at the back can be redrawn in another way as follows:

²⁴⁴One instance of usage of *prishṭha* to mean ‘back’: “Ukshannaya vashannaya soma **prishtaya** vedhasee sthomair vedhemaagnaye”

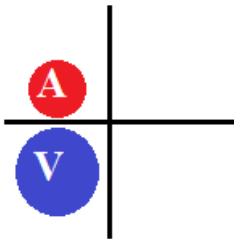
Meaning: “Agni who has Soma for his **back** and has uksha and vasha for food”

Source: Taittiriya Samhita 1st Kanda 3rd Prashna, last anuvaka, 29 panchashat.



Arundhati is exactly at the back of Vasishtha. This was the way the Sapta Rishis were described as being kept at the *prishṭha* of the troops!

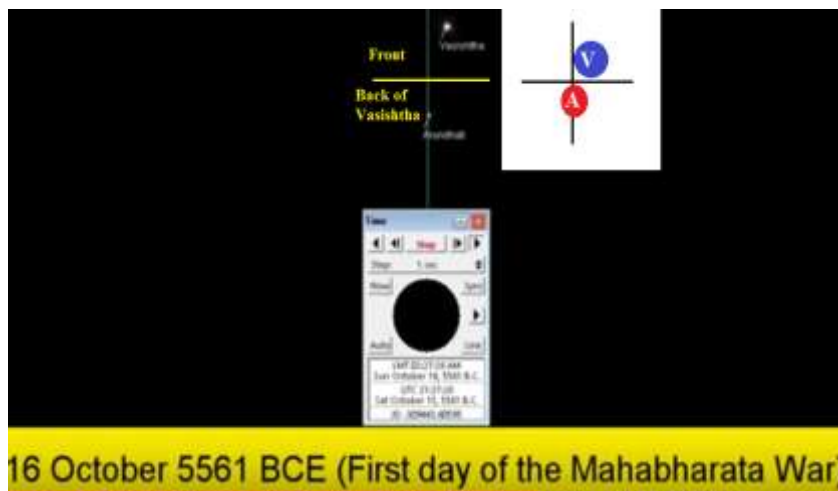
The reversal of the above figure happens if Vasishtha is said to be at the *prishṭha* of Arundhati. In that position the alignment looks as follows.



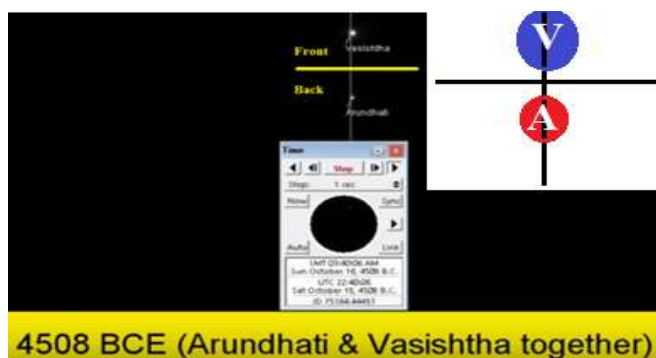
If Arundhati had kept Vasishtha at her back, this is how it could have looked. If she is in front of or ahead of Vasishtha, the term *prishṭha* could not have been used. By “*pr̥ṣṭhataḥ kṛtaḥ*” the only possible alignment is changing places with Vasishtha and Vasishtha appearing at the hind part of Arundhati.

But what does Nilesch Oak show to us from the Simulator? He shows the march of Vasishtha and Arundhati with no change in the alignment between the two. Arundhati continues to be at the *prishṭha* of Vasishtha and not vice versa. The following figures taken out from his video²⁴⁵ for the period of The Epoch of Arundhati do not show Vasishtha at the *prishṭha* of Arundhati anytime throughout the Epoch.

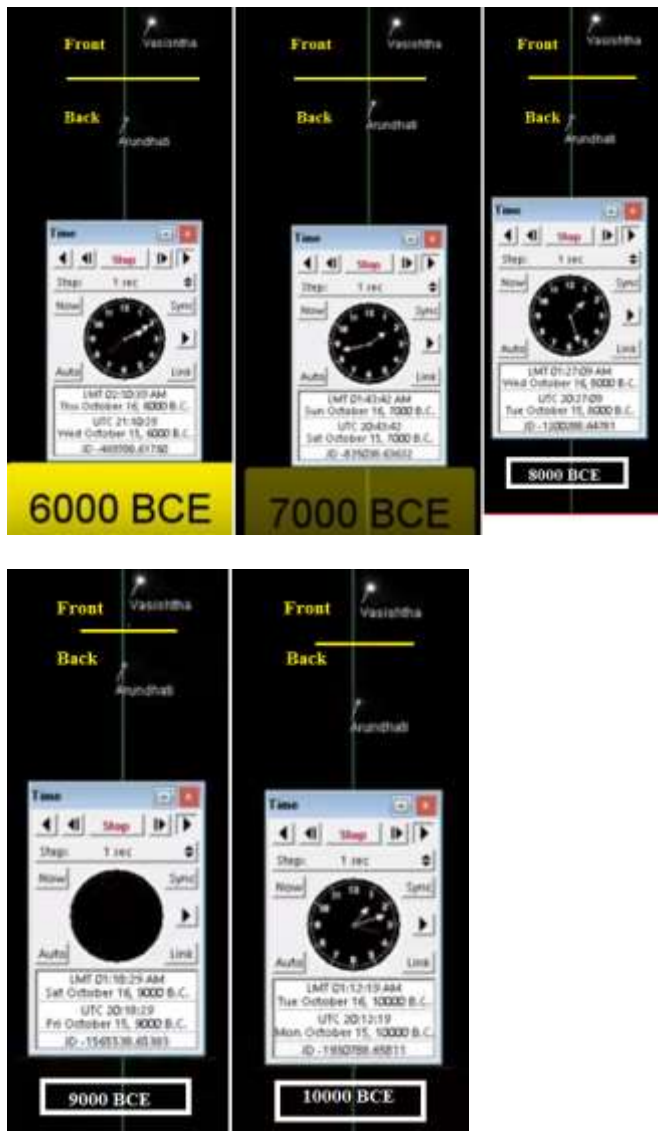
²⁴⁵ “Arundhati-Vasishtha observation - Last 18,000 years”
<https://www.youtube.com/watch?v=mjp562gskx0&feature=youtu.be>



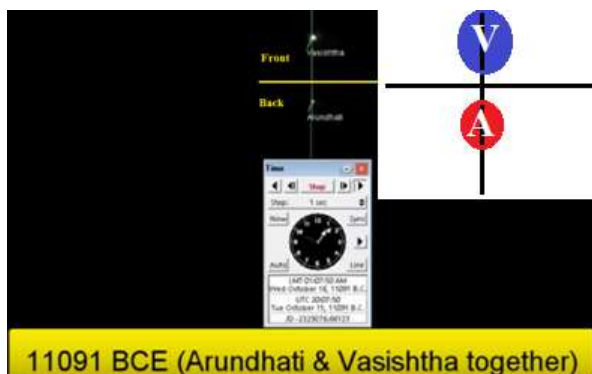
I have drawn a horizontal line in yellow that cuts the meridian at right angles. I have written the position of Vasishtha as front and the region below the yellow line as back. The alignment is reproduced in the inset next to it. It is very clear that Vasishtha is above and Arundhati is below. This picture does not show Vasishtha at the **prishṭha** of Arundhati. The same alignment existed in the first year of his so-called Epoch of Arundhati when he said Arundhati and Vasishtha were together (picture below)



In the other years of his Epoch of Arundhati, we don't find any change in the alignment of Vasishtha and Arundhati. Vasishtha is not at all seen at the **prishṭha** of Arundhati!



In the last year of Epoch of Arundhati, the same alignment continues. Then also Arundhati was at the *prishṭha* of Vasishtha and not vice versa.



Nilesh Oak may claim that the left- right alignment of Arundhati had changed in these years. But that is not what *prishṭha* means. That is not what Vyasa had said in the verse. Nilesh Oak may even point out that Right Ascension of Arundhati was lesser than that of Vasishtha in

those years. So what? Did Vyasa anywhere talk about Right ascension of Arundhati or the time when Arundhati crossed the meridian?

Having taken a verse as the Basic Sentence, Nilesh Oak must prove what the sentence says.

The sentence says that Arundhati kept Vasishtha at her back. THE FORMAL REQUIREMENT OF THE FALSIFIER IS TO SHOW VASISHTHA AT THE PRISHTHA POSITION OF ARUNDHATI. None of the figures taken from the Oak's simulations concur with this position. Not a single frame of the video uploaded by Nilesh Oak in support of A-V observation shows Vasishtha at the *prishtha* of Arundhati.

But what does Nilesh Oak say?

He says he has de-mystified the Mystery of Arundhati!

According to him, his A-V observation

“..presents ‘ready falsification’ for any proposed date, proposed in the past or that might be proposed in the future, for the Mahabharata War, that falls after 4508 B.C.”²⁴⁶

Karl Popper must be turning in his grave for the grave mis-use of his theory and his name!

²⁴⁶“When did the Mahabharata War happen?” Page 196.

Chapter 9

NIMITTA IS NON-FALSIFIABLE

The second problem with the Basic Sentence of Nilesh Oak is more serious than the first, and it disqualifies the entire research of Mahabharata dating, by taking it out of purview of empirical research. The problem here is that *nimitta* is not part of astronomy; it comes under the domain of astrology. Karl Popper straightaway rejects astrology as a pseudo-science and therefore cannot be falsified. It was already discussed in the 6th chapter how Nilesh Oak had done selective reading of the A-V verse, by ignoring the fact that it is a *nimitta*.

Selective reading is further seen in the omission of Karna's reference to astronomy features as *nimitta* in his book. **Karna** has used the word 'Nimitta' three times in his conversation with Krishna. In the first instance he uses the word *nimitta* to mean '**cause**' – the cause being himself besides Shakuni, Dussasana, and Duryodhana for the destruction of the earth.²⁴⁷

In the second instance Karna refers to seeing terrible *nimittas* before listing them out ("*nimittāni ca ghorāni tathotpātāḥ sudāruṇāḥ*") indicating **defeat of Dhritarashtra's sons** and the victory of Yudhishtira.²⁴⁸ These *nimittas* are of diverse kinds, all in the nature of signs emanating from animate and inanimate things in the earth, atmosphere and space. But such signs are treated as causes connected with certain effects.

In the next verse Karna starts mentioning the astronomy features such as the one on the 'vakri' motion of Mars²⁴⁹; that was interpreted by Nilesh Oak in his own way. After listing out all the planetary and star based observations, Karna once again invokes the term *nimitta* to say that all those *nimittas* are indicating the approach of a terrible slaughter ("*nimittesu mahābāho dāruṇaṁ prāṇināśanam*")²⁵⁰

Nimittas appear in other contexts too. Drona sees certain omens before the death of Bhishma on the 10th day of the War²⁵¹ - of which were also seen by Yudhishtira before the death of

²⁴⁷ Mahabharata: 5-141-2 <http://www.sacred-texts.com/hin/mbs/mbs05141.htm>
yo 'yaṁ pṛthivyāḥ kārtsnyena vināśaḥ samupasthitaḥ

nimittaṁ tatra śakunir ahaṁ duḥśāsanas tathā
duryodhanaś ca nṛpatir dhṛtarāṣṭra suto 'bhavat

²⁴⁸ Mahabharata: 5-141-5 & 6 <http://www.sacred-texts.com/hin/mbs/mbs05141.htm>

²⁴⁹ Mahabharata: 5-141- 8 "kṛtvā cāṅgārako vakraṁ jyeṣṭhāyām....."

²⁵⁰ Mahabharata: 5-141-12 <http://www.sacred-texts.com/hin/mbs/mbs05141.htm>

²⁵¹ Mahabharata: 6-108 -3 to 16 <http://www.sacred-texts.com/hin/mbs/mbs06108.htm>

Krishna that took place on the 36th year after Mahabharata War.²⁵² Some of the omens at that time were a repeat of the omens witnessed at the time of Mahabharata War, says Yudhishtira. But the A-V observation was not cited at any other time, anywhere in Mahabharata.

Nowhere in his book “[WHEN DID THE MAHABHARATA WAR HAPPEN? THE MYSTERY OF ARUNDHATI](#)” published in the year 2011 do we come across any reference to nimitta. This makes us think that

- (1) Nilesh Oak was not at all aware of the presence of this term in the context, and this reiterates our stance that he had done only selective reading of Mahabharata. Even within a chapter he had searched for astronomy terms only and not bothered to read the entire chapter.
- (2) Nilesh Oak was not aware that the word ‘*nimitta*’ is *part of astrology*! If he was aware, he could be expected to have given some explanation like he did for vakri and pīdayate.

Contrary to his absolute silence on Nimitta in his book, he is found to give newer meanings to Nimitta in his characteristic way in his blogs in the year 2014. These explanations are mostly in response to criticisms. It is not difficult to deduce the reason for his sudden interest in Nimitta. He has become alive to the issue of nimitta after being challenged on the admissibility of a nimitta for scientific testing. Here again he can be seen developing a new idea of nimitta every time he speaks about it and predictably his explanations are not based on any theory but only on Voyager – Simulation Nyaya!

Nilesh Oak’s Nimitta concepts.

(i) The A-V observation is not a unique nimitta and it is just one among many.

In his blog written on February 2014, Nilesh Oak downplays the question on why suddenly Vyasa makes a mention of A-V as a nimitta if that phenomenon was happening for thousands of years before the War. He says there are numerous nimittas which Vyasa listed down with the intention of stopping the war. Among them he mentions A-V phenomenon too as it also happens to be a nimitta. He mentions about Karna too in this context while he is absolutely silent in his book about Karna speaking on nimittas. His blog entry is re-produced below.²⁵³

²⁵²Mahabharata: 16-1 – 1 to 6 <http://www.sacred-texts.com/hin/mbs/mbs16001.htm>

²⁵³“Arundhati- Vasishtha (A-V) observation of Mahabharata”
<https://nileshoak.wordpress.com/2014/02/03/arundhati-vasishtha-av-observation-of-mahabharata/>

Why suddenly it was such a big deal, that it was worth mentioning in 5561 BCE.

The answer is because a big destructive war was going to happen, many were trying their best to stop it. Vyasa was making a last min attempt and in describing evil omens (as a last min effort to see if he could influence Dhritarashtra in any way) he mentions various inauspicious omens. This list includes numerous astronomy observations of that time (30 of them by my count) and among these 30, he mentions this one observation of Arundhati walking ahead of Vasistha.

Is this a unique instance within Mahabharata where Vyasa is making a list of inauspicious omen? Not at all, on the contrary, such lists of evil omens appear anytime a disaster is anticipated. Karna mentions them during his conversation with Krishna, before the War and Vyasa mentions them before and during the dual between Bhima and Duryodhan. These omens included astronomy observations. There are too many instances to mention.

In fact same thing can be said of Ramayana (These are fresh on my mind and thus easy to list)

(ii) Nimitta is a non-regular, non-ordinary phenomenon, but scientifically explainable.

On being told that a Nimitta is not a regular or ordinary phenomenon, and therefore the A-V observation running for more than 6000 years cannot be a nimitta – Nilesh Oak can be seen giving a justification in his blog in September 2014.

He proposes that a non-regular and a non-ordinary phenomenon could have happened in a distant past and documented or could have come in oral tradition or remembered as background knowledge. He writes as follows in his blog:²⁵⁴

(7) Thus what astronomy phenomenon qualifies as an 'omen' depends on the context (knowledge, documentation of astronomy tradition/records, lifespan of an individual, and his/her background knowledge of the phenomenon.. based on tradition – oral or otherwise)

Vyasa remembered such an old time when the non-regular, non-ordinary phenomenon (A-V observation) did not happen and therefore treats the observation as a nimitta.

Theory of Omen and AV observation

The fact Vyasa treats visual observation of A walking ahead of V as an omen (and thus non-ordinary, non-regular phenomenon) also means (per definitions of Omen) that Vyasa was also aware of the times when Arundhati DID NOT walk ahead of Vasistha!

Fortunately, with modern technology at our disposal, we can (as I have already done) find out those times, beginning with the time when A was walking ahead of V, and then going back in antiquity, when Arundhati was NOT WALKING ahead of Vasistha. We know that the time period, in antiquity, beyond 11091 BCE, qualified as this time interval.

According to him, he has found this non-regular, non-ordinary phenomenon in his simulator for a period of 6000 years! In a period of a million years, the A-V phenomenon running for 6000 years is non-regular, non-ordinary, according to his scientific acumen.

²⁵⁴“Response to Shri Shrikant Talageri – Part 8 of 8” <https://nileshoak.wordpress.com/2014/09/14/response-to-shri-shrikant-talageri-part-8/>

Theory of Omen has the following consequence for the AV observation:

AV observation must be a non-regular, non-ordinary observation of the sky.

Let's test this consequence:

The outcome of our testing tells us that AV observation was indeed a non-regular and non-ordinary observation of the sky. When one takes into account, beginning with today (13 September 2014) and going back into antiquity for say 10,00,000 years. We can go back, even further, in antiquity, but million years would suffice for our subject under discussion.

What we have done is made the theory of Omen testable (and thus scientific) and a consequence of that testing is leading us to the knowledge (at least a knowledge claim) that there existed a tradition of ancient astronomy observations that spanned for thousands of years (and our testing tells us that more than 6000 years prior to the time of Vyasa, and thus Mahabharata).

Only way Vyasa would have been aware of this phenomenon (Arundhati walking BEHIND Vasistha) would be based on ancient tradition of astronomy observations (This is in keeping with the scientific character of the theory of Omen by NOT allowing it to turn metaphysical, i.e. claiming paranormal abilities for Vyasa).

He is able to prove through his Simulator that an omen is a scientifically explainable phenomenon²⁵⁵

(iii) Nimitta is a sign and must not be confused with 'Bad omens'.

Taking a big leap from 2014, Nilesh Oak writes in response to a comment in his blog in March 2017 that nimittas are signs that are **perceived depending on one's mental and emotional state**. The confusion is in the Indic minds that attempt to defend their prior conclusions. The idea of '**Bad omen**' is not what Vyasa has conveyed. He has only conveyed the astronomy observations for the purpose of recording history. This view of Nilesh Oak is reproduced below.²⁵⁶

All that Vyasa is doing is mentioning 'Nimitta' (signs) at the time of war.

Vyasa has mentioned numerous other astronomy observations (let's stick to 'theory of astronomy observations'....otherwise Indic minds can go downhill in a min). Vyasa has mentioned position of the Saturn in the context of 3 specific nakshatras, position of Jupiter also, in the context of 3 nakshatras, position of Mars and its specific movements through 5+ nakshatras, position of Venus around a nakshatra and its specific motion, few conjunctions of planets in the context of the moon or the sun.

None of this could be considered a big deal. The fact that this is a big deal is the confusion of those who can not pull themselves out of their confusion of 'Nimitta (signs)' with that of 'BAD OMENS'.

Signs are what they are. Depending on one's mental and emotional state, one may perceive them as BAD or GOOD. The same astronomy signs were in the sky (whatever they were) ..but were perceived by one party as GOOD and another party as BAD. This can be seen, read and understood from multiple instances of Mahabharata and even from similar instances in Ramayana.

²⁵⁵Ibid

²⁵⁶“Response to Shri Shrikant Talageri – Part 8 of 8. <https://nileshoak.wordpress.com/2014/09/14/response-to-shri-shrikant-talageri-part-8/>

And these instances are not difficult to detect and study. Unfortunately for many Indian researchers, efforts stop at defending their prior conclusions. Fortunately there are few good researchers who are open to question their own conclusions and many new are emerging.

—
Thus the confusion of AV observation as a big deal is due to those who try to understand it from the lens of 'BAD OMENS'. It is their lens, not that of Vyasa.

Vyasa has listed numerous astronomy observations, more likely, with the simple aim of noting down the time of Mahabharata war. This is a common practice and can be observed, as done by Pandits performing a Hindu ritual, where the location and time (in terms of Yuga, kala, year, month, Nakshatra, Tithi, muhurta,,etc.) are recited.

Evaluation of Nilesh Oak's Nimitta concepts.

(i) Nilesh Nilkanth Oak is consistently inconsistent in his explanation for nimitta.

The causes are not difficult to find. He was caught off-guard on A-V observation being a nimitta and can be seen struggling to give a reply that occurs to him every time he is confronted. **From not recognising a word 'nimitta' in his book,** Nilesh Oak can be seen to make a meandering journey through an array of explanations in his blogs which, to use his own words on Vartak's explanation for astrological words of Mahabharata, shows him *"forced to employ numerous patchworks.."*²⁵⁷ to justify and then reject the very concept of Nimitta as used in Mahabharata!

- A cursory look at the three different explanations he has given shows that within a span of three years he has changed his opinion of Nimitta from being a bad omen that Vyasa expressed in a last minute effort to stop the War, to a declaration that Vyasa did not see through the lens of bad omen!
- From Bad omens in February 2014, the nimitta had just become 'signs' in March 2017. May be if a re-print of this book happens, we can expect a new theory on Nimittas finding place in that.
- Inconsistency is further evidenced in Oak's rationale of why Vyasa expressed the nimittas. According to Nilesh Oak, Vyasa narrated them to make a record or to note down the time of War. (He says this without any proof in support of this claim).
- If so, what then was the purpose of Karna to express the nimittas? Did he express them for record-purpose?

²⁵⁷"When Did The Mahabharata War Happen?" Page 187

- Then what about Drona whom Mahabharata hails as a great knower of nimittas? (*“nimittāni nimittajñāḥ sarvato vīkṣya vīryavān”*)²⁵⁸
- Even Arjuna and Yudhishtira had expressed the nimittas. What for they expressed them?
- Any reader can see a common thread in all the narrations as indicative of some danger. But Nilesh Oak, habituated to selective reading, finds Vyasa doing the record work and leaves out others from the purview of his lens.

(ii) Nilesh Oak has no respect for traditions and the “Indic minds” that stick to tradition.

The very topic he has taken is to prove a violation of a tradition by one (Arundhati) who is hailed as an icon of a tradition. This by itself is an affront on the Indic culture. His contempt for tradition and Indic culture is further reiterated by his comment posted above that the “Indic minds” would go downhill in a minute on talking of nimitta. He has no qualms in expressing his contempt for traditions in his book where he says,

*“I consider traditional belief **worthless**, as primary evidence, in support of any theory however I am willing to allow it as corroborative evidence for an established theory, i.e. established based on empirical evidence.”*²⁵⁹

What do all these convey except that he is working on an agenda to derail the tradition, destabilise the Indic belief system and influence the young and unsuspecting minds by choicest words on empiricity, luring them away from deep rooted traditions? His contempt for traditional concepts is well evident from his utter lack of interest to learn the basics of Mahabharata astronomy in the traditional way but to replace them with his weird absurdities.

(iii) If omens are testable, why didn’t he test other omens?

Nilesh Oak claims to have proved by A-V observation that omens are testable and thus scientific. This raises a question whether he had tested other omens too. There is no indication that he had tested any other omen expressed by Vyasa except the astronomy observations. If an omen is scientific and therefore testable, then all the omens must obey testability. But Nilesh Oak makes a statement in his book,

“I claim that all astronomical statements are testable while all non-astronomical statements are not; at least not with our current knowledge of Mahabharata conventions, current

²⁵⁸ Mahabharata: 6-108-3 <http://www.sacred-texts.com/hin/mbs/mbs06108.htm>

²⁵⁹ “When Did The Mahabharata War Happen?” Page 98.

interpretation of non- astronomical passages and current advances in technology at our disposal.”²⁶⁰

If omens of non-astronomical nature are not testable, is it right to claim that omens are testable and therefore scientific? An omen is an omen irrespective of whether it is an astronomy reference or non-astronomy reference. A common thread must run through all of them. Without identifying that common thread how can Nilesch Oak segregate the omens as testable and non-testable? *A degree of objectivity will be achieved in his research*, only if he tests other omens too. Such testing strengthens his version that omens are testable and scientific. And it also eliminates doubts on whether A-V observation was just an aberration.

If on the other hand *it is not possible to test the other omens, then it would go without saying that A-V testing is also not possible and not true*. For instance, can he test scientifically the 2nd omen in Vyasa’s list that carnivorous animals and fierce herons were wheeling across the centre towards the southern region foreboding terror? He can’t. But it may be replied that movement of such animals anyway cause fear in the mind. If so, why is it specifically said they were moving to the south? Why not to the north or any other direction? Shouldn’t he test this also for different directions? Even if one omen is not testable, there is no logic in claiming that omens are testable.

(iv) Why A-V observation was not at all mentioned by others as a nimitta if it was around for more than 6000 years?

Vyasa was not alone in having spoken about nimittas around the time of Mahabharata War. Just before the start of the war **Arjuna** expressed to Krishna, the bad nimittas he was seeing. On the 10th day of the War **Drona** reported the nimittas around him. Karna had told about the nimittas during his meeting with Krishna and Yudhishtira sighted nimittas of the same kind on the 36th year after the War. But strangely **NONE OF THEM MENTIONED THE A-V OBSERVATION WHILE THE NIMITTAS MENTIONED BY THEM WERE OF SIMILAR NATURE.**

The fall of the bow from his hand was reported by Arjuna as a nimitta before the start of the war. In the same way Drona found his arrows coming out of the quiver on their own and his bow seeming to yawn. He reported this on the 10th day of the war. Most of the nimittas told by these two and others (Karna and Yudhishtira) were almost the same. **Only Drona makes a strange sighting of Moon, rising with its horns (head) downward!** *A big astronomy fact is hidden behind this nimitta which solidly establishes that the war didn’t start on Amawasya day.* Keeping

²⁶⁰ Ibid. Page 58.

that explanation for the 12th chapter let me continue to concentrate on Nilesh Oak's absurdities around nimitta.

No other Mahabharata character reported the sighting of Arundhati keeping her husband at her Prishṭha! According to Nilesh Oak this position was continuing for thousands of years. This must have become a kind of **permanent nimitta**! But why Vyasa alone mentioned it?

Suppose it is argued that others ignored it because it was a permanent nimitta, one cannot help asking *what made Arjuna to ignore this nimitta (A-V) when he expressed in the worries about women being made to face hardships on account of the war*. This discussion comes in the 1st chapter of **Bhagavad Gita**. After expressing the bad nimittas seen by him Arjuna went on to express the kind of destruction the war was going to make. One among them was the state of '*Kula-stree*' on losing her husband in the war.²⁶¹ The kind of changes in her life that she would be forced to undertake, leading to adharma, were narrated by him. **THERE IS AMPLE SCOPE TO LINK IT WITH THE NIMITTA OF CHANGE IN THE WALK OF THE ICONIC KULA-STREE, I.E. ARUNDHATI** that any ordinary person would be tempted to do. But Arjuna couldn't think of the changed position of Arundhati as a nimitta for the expected change in the life of Kula-stree-s after the war.

Only if the A-V observation was a temporary aberration, seen only by Vyasa and not others, it could have gone missing in the narrations on nimittas by others.

(v) Can Nilesh Oak show any other omen that ran for 6000 years as A-V did?

The most common feature of all the other omens in the list of Vyasa, Karna, Drona and others is that they are all **transient**. At the most some of the nimittas could have lasted for a few days. The twilight sightings, appearance of stars and planets, the colour, the cries, the sounds all around – all these were temporary and did not last long. *Only the A-V observation as tested by Nilesh Oak has lasted for more than 6000 years*. In other words, the A-V stands out from the list of other omens, making it appear that it is not an omen. But it is an omen according to Vyasa. By way of its non-regular, non-ordinary nature like other omens, the A-V also must have been sighted and lost within a short period. That only sounds logical in the context of omens.

ALL TALK OF SCIENTIFIC TESTING OF OMEN BY NILESH OAK THEREFORE SOUNDS LIKE A DESPERATE ATTEMPT TO SAVE HIS THEORY OF EPOCH OF ARUNDHATI. He has all the right to defend it but defend he should with objectivity in his research. Such objectivity demands that

²⁶¹Mahabharata: 6-23-40 to 44 <http://www.sacred-texts.com/hin/mbs/mbs06023.htm>

he proves other omens testable (point iii) BESIDES PROVING AT LEAST ONE OMEN TO HAVE LASTED FOR THOUSANDS OF YEARS AS A-V DID. If he cannot prove even one omen for that long, then there is no objectivity in either claiming A-V as an omen (for being an odd man in the list of omens) or assign thousands of years for this single omen while others are all transient.

A Popper-follower, claiming to have made a revolutionary discovery, had made his ‘discovery’ from a Basic Sentence on a Nimitta – of dubious nature! With no inkling of what a nimitta is and *not even aware that he has taken a nimitta as his Basic Sentence*, Nilesh Nilkanth Oak has done ‘scientific’ dating of Mahabharata War by proving that a nimitta lasted for more than 6000 years! The root cause for this claim is that HE DIDN’T KNOW WHAT A NIMITTA IS AND THOSE WHO BELIEVE HIS CLAIMS ALSO DO NOT KNOW WHAT A NIMITTA IS! To clear the air of the mess he has created let us know what a nimitta is and why A-V observation is only a nimitta and not an astronomy event.

What is a nimitta?

The most common meanings of Nimitta found in Vedic literature such as Upanishads, Manu Smriti and Brihat Samhita are **cause, motive, ground, reason** etc..²⁶² A cause that gives rise to an effect is a nimitta - an example of it is seen in the dialogue of **Karna** (explained in the beginning of this chapter) quoting himself and his friends as the nimitta (cause) for the destruction of the earth.²⁶³ This is visible cause where we know how the cause ‘worked.’ Sometimes the effect is visible and the cause also is visible but how the mechanism of the cause worked to fetch the effect remains invisible. In such cases the causes would be short lived.

Giving the **Vyakharana meaning** of the word Nimitta, Mr. **Ramanathan**, the Vedic scholar says that a nimitta is an *unstable first cause from which a stable effect is formed*²⁶⁴. The ‘**ADHRUVA**’ (not fixed, non permanent) nature of the first cause makes nimitta a temporary occurrence! The unstable cause giving rise to a stable effect is a nimitta.

The A-V nimitta does not belong to the former category of ‘stable’ cause (eg: the continuing enmity of Karna and others resulting in destruction by war) but the second category of momentary ‘unstable’ cause where a feature just flashes for a moment – against its normal

²⁶² <http://sanskritdictionary.com/?q=nimitta%22&lang=sans&iencoding=iast&action=Search>

²⁶³ Mahabharata: 5-141-2

²⁶⁴ “*yaḥ prekṣāpūrvakārī bhavati saḥ adhruveṇa nimittena dhruvaṃ nimittamupādatte vedikāṃ puṇḍarīkaṃ vā*”. Maha Bhshya. on I.1.26 Vart.5.

nature- signaling the arrival of unnatural effects. *This cause (nimitta) cannot go on for 6000 years; if it does, it is not a nimitta of Adhruva nature.* A fixed appearance of A-V in a particular alignment for 6000 years is not a nimitta at all in any sense. It is just an appearance and Vyasa need not have talked about this appearance as a nimitta. The definition of ‘nimitta’ completely rips apart the notion of Nilesh Oak that A-V nimitta was running for more than 6000 years!

The description given by **Varahamihira** in his chapter on nimitta says that “*Devas send down portents to indicate their displeasure*” when “*mankind, by their misdeeds offend the Devas.*”²⁶⁵ Such expression of displeasure cannot go on for thousands of years as Nilesh Oak claims for the A-V observation. The reason why Vyasa reported the nimittas to king Dhritarashtra is obtained from the same verse of Varahamihira that “*the king shall perform expiatory rites for the redress of the miseries which otherwise are sure to befall mankind.*” So it is not for record purpose, but to warn the king so that the king can undertake propitiatory measures.

The **non-seasonal, non-regular nature of nimitta** can be explained in the following way. The **cows** are said to look up at the sky or at the sun before the arrival of rainfall. Similarly **ants** are supposed to shift from place to place carrying their eggs just before the arrival of the rainfall. These actions are said to be nimittas for rainfall. In these two occasions, no rain clouds might have been sighted initially, but these animals were able to sense the arrival of rainfall hours before. The main feature of the nimitta is its immediate relevance. They appear at the moment to indicate an event that is going to appear shortly.

In the above examples on rainfall nimitta, there is no relevance for them in the rainy season. People would anyway be aware of impending rainfall from features such as wind and cloudiness in a rainy season. But in a non-seasonal time, the above two nimittas are of value to man to be prepared for a sudden and un-seasonal rainfall. Therefore a nimitta is one that is non-regular and non-seasonal. This is different from what Nilesh Oak mentions as non-regular, non-ordinary nature of A-V. **APPEARING IN A PARTICULAR CONFIGURATION FOR 6000 YEARS IN A SPAN OF MILLION YEARS IS NOT A NIMITTA.** But appearing in that configuration anytime other than those 6000 years is a nimitta!

²⁶⁵Brihat Samhita: 46-3

Mahabharata, peak time of Nimitta knowledge.

Looking at Indic past, it is seen that the knowledge of nimittas as a science reached its peak during Mahabharata times. Drona is described as *nimittajñah* (निमित्तज्ञः) as one knowledgeable in nimittas. Another character namely *Shakuni must be a knower of omens*, for his name Shakuni is actually the name of a bird of omen. His son was known as *Uluka* – the owl which is also observed for omens. It sounds strange that these persons of Mahabharata times were **named after ominous birds**. The only probable explanation could be that *they must have mastered the omens of Shakuni and Uluka birds respectively*.

Giving credence to this idea is a reference to “**Mahabharata Shuddhi Shakuna**” found in a text called ‘**Nimitta Choodamani**’! This text is originally a palm leaf manuscript found in the Oriental Research Institute Manuscript Library, at Sri Venkateswara University, Tirupati. The unique feature of this text is that it begins with the description of the ‘dice’ and how to make it. After describing the making of the dice and the markings on it, the text says that “*Previously Lord Sri Krishna, Dharmaraja, Bheema, Arjuna, Nakula and Sahadeva were said to have used this to know Shakuna and gained a lot out of it. It is also called Mahabharata Shuddhi Shakuna*”²⁶⁶

It is possible to link Shakuna with dice game, as the number on the dice decides whether one makes losses or gains. No wonder concepts of Nimitta or Shakuna had reached its peak in Mahabharata times as can be seen from many references to nimittas in the text.

The basis of Nimitta in the two instances discussed above is that all beings are sub-consciously linked with all the other sentient or non-sentient beings and are capable of knowing beforehand an impending event. The immediacy factor is inherent in this – both in the case of nimitta and the event indicated by the nimitta.

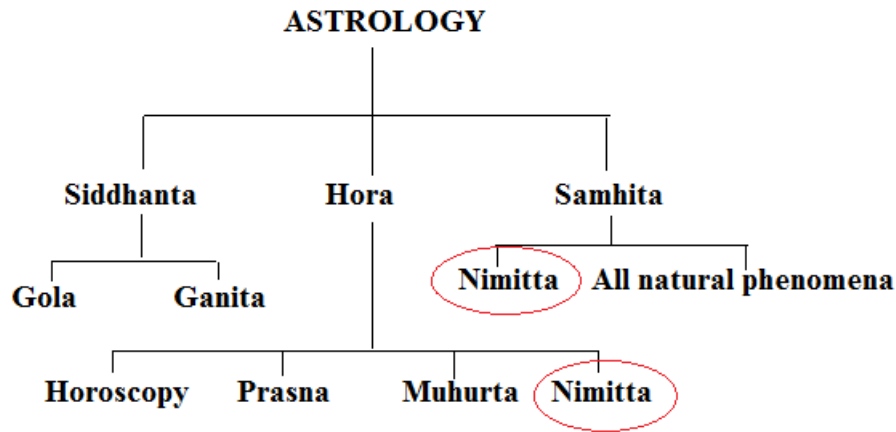
Summarising what a nimitta is,

- It is an omen that appears at the moment
- Is non-seasonal
- Has immediate relevance, with the event appearing shortly thereafter

²⁶⁶Nimitta Choodamani. Translated by V.Raghavendra Rao www.saptarishisastrology.com

Nimitta is a concept of Astrology.

Nimitta as a consolidated and a systematic knowledge appears only in astrology. The classification of the branches of astrology is given below.²⁶⁷



Astrology is also classified in terms of angas. They are six in number, viz., Jataka, Gola, Nimitta, Prasna, Muhurta and Ganita.²⁶⁸

So anyone working on Nimitta is in reality dealing with a branch of astrology. Nimitta takes into consideration “TATKALIKA LAKSHANA” – like ants shifting places and cows looking at the sky, and not an event going on for 6000 years! Nimittas are known as ‘OMENS OBTAINING AT A PARTICULAR TIME’.²⁶⁹

Chapter 46 of **Brihat Samhita** gives a detailed account of the omens attributed to sages **Garga** and **Atri**. They are of three kinds, terrestrial, atmospheric and stellar. The description of nimittas by Vyasa, Karna and Drona covers all the three. Omens are indicated by idols of Gods too. Vyasa’s omens include them also.

But there is one kind that does not qualify as an omen. To quote Varahamihira, “IF THE PHENOMENON IS ONE DUE TO THE PARTICULAR SEASON, THE EVILS DESCRIBED FOR SUCH PHENOMENON WOULD NOT COME TO PASS.”²⁷⁰

- This means a recurring, seasonal or regular and an everlasting phenomenon does not qualify to be an omen.

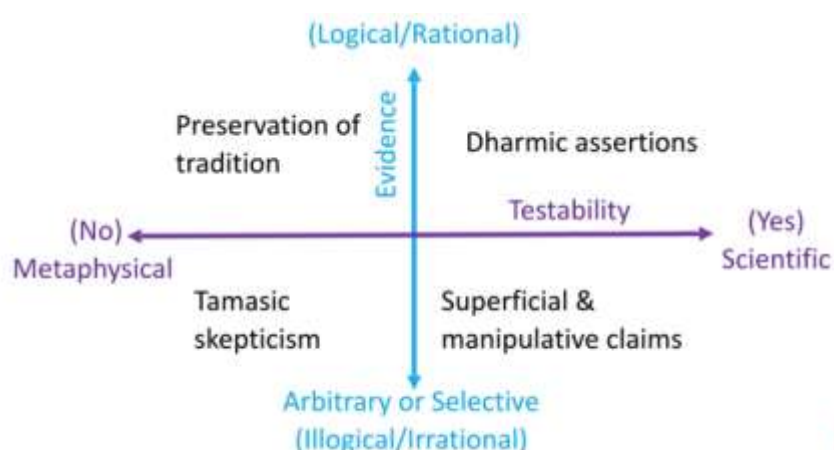
²⁶⁷Prasna Marga: 1-5 to 8

²⁶⁸ Ibid.

²⁶⁹ B.V.Raman in Prasna Marga I- 5 to 8. Page 4

²⁷⁰Brihat Samhita: 46 – 82.

- In Nilesh Oak's scheme the A-V observation did not last for just a few minutes or a day or two or a few months. It went on for more than 6000 years. That means it was a regular event. A regular event cannot be considered as an omen.
- If it is to be an omen, it must have been sighted for a short duration only. Vyasa called the A-V observation as an omen only, which means its appearance was momentary.
- Are omens scientific in nature? A verse by Varahamihira in this chapter states that omens are the words of Gods themselves (quoted earlier).²⁷¹ Is that scientific or non-scientific? Nilesh Oak's following illustration offers the answer for this.



Nimittas are metaphysical, though some of the terrestrial nimittas such as those related to cows and ants explained above have been noticed through generations and remembered as nimittas. Nilesh Oak has rightly marked the metaphysical assertions as preservation of tradition. May be for the first time so far, I am able to concur with Nilesh Oak on his view! But unfortunately he thinks that a nimitta (A-V) is testable and therefore scientific. **THE TEST OF A NIMITTA IS IN THE MANIFESTATION OF ITS EFFECT; IT CANNOT BE SEEN IN THE SIMULATOR!**

It is upto Karl Popper- follower to decide whether he made a wise decision of making a nimitta falsifiable.

Non-regular appearance of Arundhati to be treated as nimitta – says Mahabharata.

Earlier in the 1st chapter it was quoted from Mahabharata that *Arundhati's unwavering position in relation to Vasishtha was observed at the time of Skanda*. Since then Vedic society has been looking up at her as an **ICON OF CHASTITY**. But there was a time she looked different. The

²⁷¹Brihat Samhita: 46 -3

appearance at that time was linked to an event in Arundhati's life. **Arundhati had once insulted her husband.** In consequence of that act *she became a little star, mixed with smoke, sometime visible and sometimes non-visible like an omen.* The relevant verses from Mahabharata are reproduced below.²⁷²

suvratāpi hi kalyāṇī sarvalokapariśrutā
 arundhatī paryaśaṅkad vasiṣṭham ṛṣisattamam
 viśuddhabhāvam atyantam sadā priyahite ratam
 saptarṣimadhyagam vīram avamene ca tam munim
 apadhyānena sā tena dhūmāruṇa samaprabhā
 lakṣyālakṣyā nābhirūpā **nimittam** iva lakṣyate

Ganguli's translation: "Even the auspicious and well-behaved Arundhati, celebrated amongst all creatures, had been jealous of the illustrious Vasishtha of great purity of mind and always devoted to the good of his wife. Arundhati insulted even the wise *Muni* amongst the (celestial) seven. In consequence of such insulting thoughts of hers, she has become a little star, like fire mixed with smoke, sometimes visible and sometimes invisible, like an omen portending no good (amongst a constellation of seven bright stars representing the seven Rishis)." ²⁷³

The last verse describes the appearance of the star as '**NĀBHIRŪPĀ**' – looking like the navel! The navel is characterised by the depression at the centre. The star had looked smoky, thereby dim with its disc appearing like a concave depression. At times the star was visible and also not visible. The scientific causes for this appearance could be anything, but the sage **Mandapāla** to whom this verse is attributed, had said that such appearances are treated as nimitta!

By categorising it as a nimitta, it is conveyed that such an appearance was **not long lasting**. In her real life too, the incident of insult and the after effect could not have lasted long and not caused any dent to her image as an icon of chastity.

The verse also conveys **THAT WHENEVER A CHANGE IN HER REGULAR APPEARANCE WAS SEEN, IT WAS TREATED AS A NIMITTA.** In the last chapter we found why Vyasa invoked the generic nature of Arundhati as a Shabda Pramāna, in our discussion on pramāna based interpretation of the A-V verse. Only if her generic state of appearance had been permanent, Vyasa could have treated the changed appearance as a nimitta. In the above narration too, *the*

²⁷²Mahabharata: 1-224- 27 to 29 <http://www.sacred-texts.com/hin/mbs/mbs01224.htm>

²⁷³Mahabharata: 1-235 <http://www.sacred-texts.com/hin/m01/m01236.htm>

changed appearance runs counter to her generic appearance, warranting it to be treated as a nimitta. Therefore a nimitta is a temporary appearance.

If this appearance had lasted for more than 6000 years as Nilesh Oak claims, the sages would have stopped viewing Alcor as Arundhati and started looking for some other binary that could fit-in the description of Arundhati not obstructing the path of Vasishtha. They did so for the changed position of the wives of the six rishis of the Sapta Rishi Mandala and picked up **Krittika** to denote the six wives. Similarly the Mizar- Alcor pair could have been abandoned and replaced by another binary. Moreover the long duration proposed by Nilesh Oak for the star to be in front of her companion runs against the very **etymology** of Arundhati. So what Vyasa had seen was a momentary appearance which was not present when Karna, Drona and Yudhishtira watched the sky to take note of the omens.

Chapter 10

NILESH OAK'S KALI YUGA-DILEMMA

Kali Yuga date starting immediately after Krishna's death is the biggest threat to the Mahabharata date deduced by Nilesh Nilkanth Oak. With just 35 years separating the Mahabharata war and the Kali Yuga, it is impossible to justify 5561 BCE as a plausible date for the war. Expectedly the traditional Kali Yuga date comes under his line of fire. Nilesh Oak finds it funny that a 'circular logic' is employed between the two to derive the date of one from the other and vice versa. He has even coined the term "KALIYUGA-MAHABHARATA NYAYA" analogous to *Shaka-Chandra Nyaya*.²⁷⁴

However he seemed to have *no issues with the date of Kali Yuga beginning at 3102 BCE, but only against the 'traditional' belief that it started 36 after the Mahabharata War*.²⁷⁵ By conducting two "Error Elimination" tests in his book, he concludes that (1) Mahabharata text does not give a consistent view of the concept of Yuga and (2) Mahabharata War happened in Dwapara Yuga. He says:

*"I want to re-emphasise that I am not objecting to 3102 B.C. as the beginning of Kali Yuga. When exactly Kali Yuga began is a separate subject and worthy of investigation, however, I consider it outside the scope of this book. All I want to emphasise is that the Mahabharata text emphasizes in no uncertain terms that the time of Mahabharata War was that of Dwapara Yuga or the transition period between Kali and Dwapara Yugas. Mahabharata references and my proposed timeline neither contradict nor support year of 3102 B.C. as the beginning of Kali Yuga."*²⁷⁶

This shows that at the time of writing his book he didn't think that his time line does upset the Kali Yuga date, nor did he oppose the traditional date of Kali Yuga. He only thought that,

"Researchers who made a big deal about the traditional date for the beginning of Kali Yuga were right in their conjecture to begin with 3102 B.C. but were wrong in justifying their conjecture." (Underline as it appears in his book)²⁷⁷

²⁷⁴ "When Did The Mahabharata War Happen?" Page 4

²⁷⁵ Ibid. Page 142

²⁷⁶ Ibid. Page 146

²⁷⁷ Ibid.

He accepted the Kali Yuga date, but opposed the way it was derived, i.e. counting from the time Krishna left his mortal coils. But the issue didn't settle down at this. Just as we saw in the case of 'nimitta', a transformation in his thoughts can be seen from what he wrote in his book to what he has expressed in his blogs few years later. Perhaps faced with the criticism that his time-line upsets the Kali Yuga date, he can be seen at his best form attacking none other than the great astronomer, **Aryabhata**! Others like **Garga** and **Kalhana** are treated as fun until the inevitable dawned on him that Kali Yuga is indeed calculated from the day of Krishna's exit. His transformation map is expressed as follows:

- **2011(book)** - Accepts Kali Yuga date and claims his timeline has nothing to do with it.
- **2014, Jan 17 (blog)**²⁷⁸
 - (1) Not much evidence for the claim that Kali Yuga started on 3102 BCE.
 - (2) Aryabhata's reference that he was 23 years old when 3600 years of Kali Yuga had elapsed was taken by researchers to assume 3102 B.C as Kali Yuga start date.
 - (3) There is no independent evidence to deduce Aryabhata's date (independent of Aryabhata) or Kali Yuga date.
 - (4) The epoch of 3102 BCE followed by many calendars of India, Srilanka, Thailand etc. is assumed from Aryabhata's reference.
- **2014, March 24 (blog)**²⁷⁹ Quoting Tilak,
 - (1) No evidence for "Yudhishtir Shaka". Usage of the word Shaka began only with Shaka rulers (Vikrama, Shalivahana)
 - (2) No one seriously thought about the Kaliyuga begin date before 'Vikrama' and 'Shalivahana' Shaka had begun – implying absence of calculations before those Eras.
 - (3) Calendar based on Buddha and Mahavir were there when these Shaka calculations began.
 - (4) **Garga** did not solve '*the problem of the timing of the beginning of Kali Yuga*'.

²⁷⁸Beginning of Kali-Yuga – Assertions & Chaos: Part 1

<https://nileshoak.wordpress.com/2014/01/17/beginning-of-kali-yuga-assertions-chaos-part-1/>

²⁷⁹ Beginning of Kali-Yuga – Assertions & Chaos: Part

[2https://nileshoak.wordpress.com/2014/03/24/beginning-of-kali-yuga-assertions-chaos-part-2/](https://nileshoak.wordpress.com/2014/03/24/beginning-of-kali-yuga-assertions-chaos-part-2/)

(5) Sapta Rishi calendar was an assumed one and the contention that the Sapta Rishis stay in a nakshatra for 100 years is contradictory to the fact of their relative motion. Garga didn't recognise this fact.

(6) *"Garga gave a serious thought in speculating/conjecturing the beginning of Kaliyuga (although on a faulty logic of Sapta Rishi cycle)"*

(7) After Garga *"It appears Aryabhatta attempted to estimate the timing of the beginning of Kaliyuga (and thus Mahabharata)"*. He assumed Ayanamsa (Nirayan spring equinox) to be zero, which was perhaps assumed erroneously from Sapta Rishi reference.

(8) Aryabhata also assumed zero ayanamsa for Kaliyuga start date, interpreted from Surya Siddhanta which Nilesh Oak is not able to make out.

(9) *"Beginning with his time, i.e. Shalivahan Shaka 421 CE (this is bit of circular logic, but I will not elaborate, only to keep moving the discussion), Aryabhatta calculated $3600 - 421 = 3179$ (before Shaka), which is same as 3101/3102 BCE."*

(10) Kalhana *'generated more fun'*. Aryabhata, Kalhana and Garga had given different years from different references. He writes,

3179 (Aryabhatta – beginning of Kaliyuga based on Ayan-Amsha completing one cycle in 3600 Years?) – 2526 (Garga – timing of Saptarshi in Magha??) = 653 years after Kaliyuga.

All the fun!

I want readers to recognize that some 50% of total proposed dates (>60 out of 130) for the timing of Mahabharata War fall in this 2500 – 3000 BCE range. And almost all (if not all) researchers decided to search in this region, based on 3102 BCE (3179 before Shaka) as the ASSUMED beginning of Kaliyuga.

2014, April 23 280(blog)

(1) *Kali Yuga year at 3102 B.C. is an arbitrary belief. "...Scientific determination of the timing of historical event is not an issue that can be delegated to a tradition, or believers of a specific viewpoint."*

(2) *"Researchers began with erroneous (either not known to them.. or they could not care less) assumption of 3102 BCE as the beginning of Kali-Yuga, then employed one references from Bhagavad Purana, failed to understand the obvious interpretation (i.e., read too much into it) and combined it with another Mahabharata observation*

²⁸⁰Dr. Elst's theory of 'The Arundhati Omen': Part 4 of 8 <https://nileshoak.wordpress.com/2014/04/23/dr-elsts-theory-of-the-arundhati-omen-part-4/>

(Krishna passing away 36 years after the Mahabharata War) to arrive at their proposed date.”

2016, July 10²⁸¹ (blog)

(1) *“Timing of Mahabharata war is (was) being connected with the beginning of Kali-yuga with the assistance of not only **few factual** but **also many assumed statements**. ”*

(2) Puranic records **do not refer to any specific evidence** to arrive at 3102 B.C, but it appears **they seem to align** with that assumption (!!)

(3) The origination and the rationale of the date remains unknown and uncertain but it appears to be fixated in the Purana literature.

(3) Mahabharata does not give any astronomy, chronology and other evidence for the Kali Yuga date. Purana writers assumed Kali Yuga date.

(4) Nilesh Oak quotes the verses from Bhagavata Purana that say that Kali Yuga entered when Krishna returned to heavens. However Oak attempts to interpret a word of the verse to say that it was ‘assumed’.

(5) After highlighting the Puranic verses on Kali Yuga date, Nilesh Oak gives the following equation of his “Kali Yuga-Mahabharata Nyaya”!

<p>The year of Mahabharata War = X The year of Krishna's passing away = X + 36 The year of beginning of Kaliyuga = 3102 BCE Thus, The year of Krishna's passing away = 3102 BCE = X + 36 The year of Mahabharata War = (3102 BCE) + 36 The year of Mahabharata war = 3138 BCE</p>
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2018, March 12²⁸²(blog)

Quotes verses from Bhagavata Purana and Vishnu Purana that say that Kali Yuga entered on the day Krishna ascended to his abode with a foreword that *“I have already shown how a casual reference (opinion of Historians of Bhagavat Purana time) led to current confusion of Mahabharata and Kaliyuga.”*

²⁸¹How the year of Mahabharata war got linked with the beginning of Kaliyuga <https://nileshoak.wordpress.com/2016/07/10/how-the-year-of-mahabharata-war-got-linked-with-the-beginning-of-kaliyuga/>

²⁸²Kaliyuga, Mahabharata & Vishnu Purana <https://nileshoak.wordpress.com/2018/03/12/kaliyuga-mahabharata-vishnu-purana/>

From the above updates available so far, one can see Nilesh Nilkanth Oak has gone a long way from 2011 to 2018, from first accepting Kali Yuga date, then branding it as an assumed date that has been promoted thoughtlessly by Aryabhata among others, questioning everything including the Shaka years and the gap of 3139 between Shalivahana Shaka and Kaliyuga and then finally veering to Puranic sources as the cause for the date but unwilling to accept it wholeheartedly.

The above list shows that **NILESH OAK HAD ABSOLUTELY NO IDEA OF MANY OF THE FUNDAMENTALS OF THE TRADITION AND THE ASTRONOMY OF THE VEDIC CULTURE WHEN HE WROTE HIS BOOK.** Just one verse on Arundhati and with that he thought he can make a path breaking discovery with the aid of Voyager simulator. Without knowing that A-V observation was a nimitta of transient nature, he ventured to treat it as a long lasting astronomy event. Without knowing that Kali Yuga is calculated from the time of Krishna's exit, he located Mahabharata more than 2000 years before Kali Yuga.

The Vyasa factor.

The glaring truth is that if he rejects the Bhagavata Purana evidence on Kaliyuga-start date, it takes no time to reject his entire research for the very reason that **Vyasa** whose Mahabharata was accepted by him as a factual text offering inputs to his research, is **the author of Bhagavata Purana** also. Nilesh Oak who swears by the factuality of A-V observation as 'Shabda Pramāna' given by Vyasa will be accused of double standards if he rejects the other work of Vyasa, namely the Bhagavata Purana which begins as a continuation of Mahabharata by giving post-war sequences.

The entry of Kali Yuga upon the *exit of Krishna* is repeated in the first and the last chapter of this Purana. The entry of Kali is also revealed in the context of how **Parikshit** received Kali Yuga.²⁸³ Parikshit being the immediate successor of Yudhishtira, after the latter relinquished the throne on hearing the exit of Krishna, it goes without saying that the entry of Kali Yuga coincided with the exit of Krishna.

It is a gross oversight on the part of Nilesh Oak to have missed the continuity in Vyasa's narration from Mahabharata to Bhagavata Purana. Whatever Nilesh Oak has said afterwards in his blogs in an attempt to deny the Kaliyuga date, has more than revealed the inadequacy of his knowledge of the fundamentals.

²⁸³Bhagavata Purana: 1-16

Does Mahabharata give inconsistent views on Yugas?

Let me now examine each view of Nilesh Oak enumerated above. Nilesh Oak states that the *“Internal evidence of Mahabharata does not produce a consistent view for the concept of Yuga.”*²⁸⁴

This is a **gross mis-judgement** on the part of Nilesh Oak who cared less to study the different pointers to Yuga concepts of that time in the text of Mahabharata. Mahabharata gives enough clues on two kinds of Yugas, one, **the 5-year Yuga** that was in vogue for all practical purposes and the other, the Chatur Maha Yuga for judging the scale of Dharma. The 5-year Yuga is well revealed in the context of Bhishma justifying the **completion of incognito period** of the Pandavas. The dates of Mahabharata war and Bhishma Nirvana can be proven only on the basis of the 5-year system, which I will be explaining in the 12th chapter.

Many characters of Mahabharata also speak about the **Chatur Maha Yugas**, for determining Brahma’s duration of life in terms of solar years and also on how the Yuga is decided by the Dharma of the King / ruler. There are instances found in Mahabharata of a fusion of Yugas and one Yuga dharma appearing in another Yuga. An analysis of all these references reveals that the 4 yugas from Krita to Kali were measured by the scale of Dharma.²⁸⁵ Dharma was on the decline at the time of Mahabharata giving the semblance of Kali Yuga, but it was not completely perceived as Kali Yuga due to the presence of Krishna. Vyasa was the first one to have grasped the change of Time in terms of Yuga Dharma and expressed it explicitly. WHEN ARJUNA INFORMED VYASA OF KRISHNA’S EXIT, VYASA SPOKE ABOUT THE CHANGE OF TIME AND THAT TIME HAS COME FOR THE PANDAVA BROTHERS TO LEAVE THE EARTH.²⁸⁶ It was only after meeting Vyasa, Arjuna went on to meet his brothers to convey the news of Krishna’s exit.

From Mahabharata to **Bhagavata Purana** we find a continuity of events following the exit of Krishna. In the very beginning of Bhagavata Purana, Vyasa repeats the bad omens seen by Yudhishtira at the exit of Krishna as was described in Mahabharata. When Arjuna brings the bad news about Krishna’s departure, VYASA SAYS (IN SUTA’S NARRATION) THE KALI HAS MANIFEST FULLY AT THE EXIT OF KRISHNA.

yadā mukundo bhagavān imām mahīm
jahau sva-tanvā śravaṇīya-sat-kathāḥ

²⁸⁴“When Did The Mahabharata War Happen?” Page 146

²⁸⁵“Yuga classification –how Yuga must be understood”

https://www.academia.edu/36652239/Yuga_classification_-_how_Yuga_must_be_understood

²⁸⁶Mahabharata: 16-9 <http://www.sacred-texts.com/hin/mbs/mbs16009.htm>

tadāhar evāpratibuddha-cetasām
abhadra-hetuḥ kalir anvavartata²⁸⁷

Meaning: “When the Personality of Godhead, Lord Kṛṣṇa, left this earthly planet in His self-same form, **from that very day Kali**, who had already partially appeared, became **fully manifest** to create inauspicious conditions for those who are endowed with a poor fund of knowledge.”²⁸⁸

In the very next verse Vyasa says that Yudhishtira having understood the arrival of Adharma (*adharma-cakram*) prepared to exit the world.²⁸⁹ Vyasa again repeats the arrival of Kali Yuga (*kalinādharmā*), perceived by the younger Pandavas prompting them to leave the earth.²⁹⁰

Thus there is consistency in the narration on the change of the Yugas and the birth of a new Yuga, and the narration continuing from Mahabharata and taken over to Bhagavata Purana by the same author Vyasa, whose words in Mahabharata are trusted fully by Niles Oak. So he cannot object to Vyasa’s version of birth of Kali Yuga as given in Bhagavata Purana. Unfortunately we find Niles Oak attempting to interpret a verse from the 12th chapter of Bhagavata Purana in his 2016 blog²⁹¹ that the Kali Yuga date was ‘**assumed**’ by **historians**, by translating it as

“The historians (पुराविद – knowers of the past, ancient times) say/state/assume (प्राहु) that the Kaliyuga began when Krishna passed away.”

This does not hold water given that Vyasa had said without mincing words in the beginning of Bhagavata Purana that Kali which was partially manifest until then became fully manifest on the day Krishna left the earthly plane.²⁹²

Evidence for Yudhishtira Shaka.

In his **March 2014 blog**,²⁹³ Niles Oak claims that there is no evidence for Yudhishtira Shaka and no one seriously calculated the time of Kali Yuga before the Shaka kings Vikrama and

²⁸⁷Bhagavata Purana: 1-15-36

²⁸⁸<https://www.vedabase.com/en/sb/1/15/36>

²⁸⁹Bhagavata Purana: 1-15-37

²⁹⁰Ibid. 1-15-45

²⁹¹How the year of Mahabharata war got linked with the beginning of Kaliyuga

<https://nileshoak.wordpress.com/2016/07/10/how-the-year-of-mahabharata-war-got-linked-with-the-beginning-of-kaliyuga/>

²⁹²Bhagavata Purana: 1-15-36

²⁹³Beginning of Kali-Yuga – Assertions & Chaos: Part 2

<https://nileshoak.wordpress.com/2014/03/24/beginning-of-kali-yuga-assertions-chaos-part-2/>

Shalivahana. Let me reproduce the evidence²⁹⁴ from ‘**Ain I Akbari**’ authored by *Abul Fazl Allami*, a contemporary of *Akbar*. He mentions King Yudhishtira as having started his own era which was followed by the eras of Vikrama and Shalivahana. He continues to name the future Shaka eras as those of Vijayabhinanda, Nagarjuna and Kalki – giving the total number as six eras in the Kali Yuga. This includes the era of Yudhishtira.

Era of the Hindús.

The creation of Brahma is taken as its commencement and each of his days is an epoch. They assert that when 70 *kalps* are completed, each consisting of 4 Yugs¹ and the total of these being 4,320,000 years, a Manu appears. He is the offspring of the volition of Brahma and his co-operator in the creation. In each of his days fourteen¹ successive Manus arise. At this time which is the beginning of the 51st year of the age of Brahma, there have been six Manus, and of the seventh, 27 *kalps* have elapsed, and three Yugs of the 28th, and of the fourth Yug, 4,700 years. In the beginning of the present Yug, Rájá Judhishtira conquered the universe and being at the completion of an epoch, constituted his own reign an era and since that time to the present which is the fortieth of the Divine era, 4,696 years have elapsed. It continued in observance 3,044 years. After him Bikramájít² reckoned from his own accession to the throne and thus in some measure gave relief to mankind. He reigned 135 years. In this year 1652 years have since then gone by. They relate that a youth named Sálbáhan,³ was victorious through some supernatural agency and

The above narration continues further by stating the arrival of Shalivahana and how he usurped Vikrama. For the gap of 135 years between the two, it is unrealistic to assume that Shalivahana defeated Vikrama. May be it was a metaphoric way of expression of replacement of an old Shaka with a new one, which I am not delving into, due to its irrelevance to this critique. What needs to be understood is the fact that a new Shaka year was started; this is corroborated by numerous inscriptions that have recorded the date from Shalivahana Shaka.

Abu Fazl continues to write that Shalivahana didn't interfere with the observance of Vikrama Era. So simultaneously both Eras had existed, but inscriptional evidence shows that SHALIVAHANA SHAKA was in widespread usage. Abul fazl's narration cannot be rejected as invalid or 'traditional belief', for, it shows how time was recorded by calculating right from the beginning of Kali Yuga. And this evidence is independent of Aryabhata's that Nilesch Oak looks for in his 2014 Jan 17th blog.

²⁹⁴ 'The Ain I Akbari by Abul Fazl Allami' translated from the original Persian by Colonel H.S Jarrett, Vol II (1891)

be obliterated from the records of the age. It is said that the boon was granted, and although he introduced his own era, he did not interfere with the observance of the other. Since this era, 1517 years have expired, and they believe that it will continue in use for 18,000 years more, after which Rajah Bijiyábhinandan will institute a new era from his own reign which will last 10,000 years. Then Nágá Arjun will come to the throne and promulgate another era which will continue for 400,000 years, after which Kalki,¹ whom they regard as an avatar, will establish a fresh era to last 821 years. These six are considered the principal eras and are called Sáká, for there were many epochs and each termed "Sanpat."² After the invasion of Sálbáhan, the era of Bikramájít was changed from "Sáká" to "Sanpat." After the expiration of these six, the Sat³ Yug will re-commence and a new epoch be instituted.

Abul Fazl has given valuable inputs for cross reference. At first he gives the Kali Yuga year as 4700 and later 4696 as the elapsed years of Yudhishtira Shaka at the 40th year of Akbar's rule. The difference of only 4 years between the two Kali dates (Kali 4700 and Yudhishtira 4696) goes to show that the first was the year of writing the book and the second, the 40th year of Akbar's rule. He also mentions *the gap of 3044 years between Yudhishtira Shaka and Vikrama Shaka.*

For the 40th year of Akbar he has given the corresponding years in Yudhishtira, Vikrama and Shalivahana Shaka.

Akbar's 40th year = 4696 of Yudhishtira Shaka.

Akbar's 40th year = 1652 of Vikrama Shaka.

Akbar's 40th year = 1517 of Shalivahana Shaka.

The 40th year of Akbar was Hijri 1003-1004 corresponding to 1595 CE in Gregorian calendar.

Checking for the recent two eras (Shaka) for which the date is not disputed we get

(1) Shalivahana 1517 + Shalivahana 78 CE = 1595 CE

(2) Vikrama 1652 – Vikrama 57 BCE = 1595 CE

Since the year tallies correctly, the year derived from the Yudhishtira date must be the true Kali Yuga date. Let me deduct 1595 (CE) from Yudhishtira Shaka date of Akbar's 40th year.

Yudhishtira 4696 – 1595 = 3101 (BCE)

This being the Yudhishtira Shaka, and also the Kali Yuga start year, it becomes clear that the Shaka computation started *after Krishna left and Yudhishtira stepped down* (which happened closely within a span of few days or months). The computation must have been initiated by Vyasa himself by stipulating the start of the Kali Yuga as the date of exit of Krishna. The clear statement of Kali Yuga start date in the first chapter of Bhagavata Purana²⁹⁵ explained a few pages above goes to show that **VYASA WAS THE ORIGINATOR OF THE KALI YUGA DATE.** Time computation must have been a far easier task for him as a knower of three times (past, present and future) compared to other stupendous tasks for which is known – compilation of the Vedas and authoring the Puranas and Mahabharata.

Concept of Shaka is old.

Nilesh Oak is of the opinion that Shaka refers only to Vikrama and Shalivahana and not Yudhishtira. (Blog: 2014, March 24). This is a wrong notion. The word Shaka comes from the root ‘Shak’ meaning “be able”. The name **Shakra** for Indra comes from this root. With the decadence of the concept of Indra expected in the Kali Yuga, the sages had mooted the idea of Shaka in the place of Indra. **THE SHAKA RULER IS ONE WHO HAS DEFEATED THE ENEMIES OF BHARATA VARSHA OR VEDIC CULTURE** or in other words, non-Vedic people, according to a Telugu text “*Vijnana Sarvaswamu*”²⁹⁶ and Kalidasa’s “*Jyothirvidabharana*”.²⁹⁷ Mahabharata war was won by Yudhishtira by subduing many tribes of North West India who were not followers of Vedic culture. He continued to be the *Shaka Karta* until Vikrama repeated the same feat. Vikrama was replaced by Shalivahana either because he defeated some non-Vedic, foreign ruler or he defeated the previous Shaka ruler, in this case Vikrama. Though Abul Fazl refers to the second probability, the gap of 135 years between Vikrama and Shalivahana makes it improbable.

Quoting Tilak, Nilesh Oak says that there is no inscription in the name of Yudhishtira Shaka. The reasons are not hard to find. Engraving on the stones was a later development with most of the stone inscriptions appearing in the Common Era only. In olden days writing in *burja patra* was in vogue.²⁹⁸ Engraving in metals such as copper was also widely prevalent and it is anybody’s guess why they were lost. The bottom-line is that absence of inscriptions does not mean absence of the Era!

²⁹⁵Bhagavata Purana: 1-15-36

²⁹⁶ “Old Thoughts” by Satya Sarada Kandula

²⁹⁷ Jyothirvidabharana: 10-109

²⁹⁸ ‘Indiya Kalvettugalum, ezhutthukkalum’ by T.S.Sreedhar, Tamilnadu Archaeological Department publication, page 25-29

Janamejaya's grant refers to Yudhishtira Shaka

However, an inscription of King Janamejaya, the son of Parikshit was quoted by Kota Venkatachela Paakayaaji in his book²⁹⁹ from Indian Antiquary P.P. 383 334. The inscription states

“Svasti Shree Jayabhyudaye **Yudhsihtrashake**”

The donation mentioned in that inscription was made in the **89TH YEAR OF YUDHISHTHIRA SHAKA** during the reign of Janamejaya. The year concurs with Janamejaya's rule as he succeeded his father Parikshit who ruled for 60 years as per Mahabharata. This grant was made in the *29th regnal year of Janamejaya*, to **Lord Sitarama** temple on the banks of Tungabhadra River, in today's **Hampi**.

The inscription gives important Panchanga³⁰⁰ details such as Plavanga year, Amawasya, Monday and Sahasya month referring to Pushya month. Only the star of the day is not given. These four out of five features of the Panchanga were checked in astrology software.³⁰¹

The horoscopy chart generated for these details show that the month was Tapasya (Phalguna) and not Sahasya indicating a scribal or transmission error. **THE FOUR FEATURES HAD CO-EXISTED ON 28TH JANUARY, 3012 BCE** with Amawasya starting around 4 PM in Gregorian calendar. (Figure 19)

Here I want to give a word of caution. Like astronomy software, the astrology software also has limitations when we are picking out dates thousands of years ago. Both softwares are accurate for the current stellar and planetary positions. However when we regress, the astronomy software becomes redundant for sidereal positions of Vedic astronomy notings. The redundancy is not too great in astrology softwares as sidereal positions are noted, but this is done for the current ayanamsa (precession degree). The following simulated version is done for the current ayanamsa position (Lahiri / chitra Paksha). Let us first see the degree of concurrence with Panchanga details of the Janamejaya grant.

²⁹⁹“Chronology of Ancient Hindu History” Part 1, by Pandit Kota Venkatachela Paakayaaji (1957) Page 13-17

³⁰⁰ Today Panchanga refers to 5 features, week day, star, tithi, yoga and karana. These 5 are part of Ashtanga that include month, year name and Yuga also. Of the 8, year name, month, week day, tithi and star form indispensable synchronisation at any time, therefore these features are used here with the familiar name Panchanga.

³⁰¹The horoscopy illustrations used in this book are generated from Jagannatha Hora software, version 7.4

Body	Longitude	Nakshatra	Pada	Rasi Chart			
Lagna	23 Le 01' 32.85"	PPha	3	Mo Sa	Su (Me)	Ur	Ma
Sun - AmK	24 Pi 48' 52.69"	Reva	3				
Moon - PiK	13 Pi 01' 29.15"	UBha	3				
Mars - GK	2 Ge 22' 49.43"	Mrig	3				
Mercury (R) - MK	17 Pi 25' 17.68"	Reva	1				
Jupiter (R) - PK	6 Li 58' 39.78"	Swat	1				
Venus - BK	20 Aq 58' 12.53"	PBha	1				
Saturn - DK	0 Pi 32' 09.55"	PBha	4				
Rahu - AK	0 Cp 41' 22.18"	USha	2				
Ketu	0 Cn 41' 22.18"	Puna	4				
Date: <u>January 28, -3012</u>							
Time: 4:00:00 pm							
Time Zone: 5:30:00 (East of GMT)				Vedic Weekday: <u>Monday (Mo)</u>			
Place: 76 E 28' 00", 15 N 20' 00"				Nakshatra: <u>Uttarabhadra (Sa)</u>			
Hampi, India				(27.31% left)			
Lunar Yr-Mo: <u>Plavanga - Phalguna</u>				Ayanamsa: <u>314-37-07.85</u>			
Tithi: <u>Amavasya (Ra) [Chitra]</u>				Sunrise: 7:03:19 am			
(98.25% left)				Sunset: 6:21:32 pm			

Figure 19: Simulated to current (Chitra-paksha) ayanamsa

Though all the features are present, one can see *Amavasya having commenced in the evening, just before 4 PM*. Generally the tithi at sunrise is treated as the tithi of the day. But in the case of Amavasya there is another version, known as *Bodhayana Amavasya* when the tithi starts on the previous evening (Chaturdasi at sunrise) and ends before sunset the next day though it was there at sunrise. On such occasions, the previous day is considered as Amavasya. This adjustment of Tithi gives rise to reduction in tithis that plays a crucial role in our understanding and interpreting the number of days given in certain contexts in Mahabharata.

Now let me give another simulated version for the same Panchanga features corrected to the precession date calculated from *Surya Siddhanta based on Makarandacharya's Tables* made in 1478 CE. In this, *the precession is taken as zero* with vernal equinox falling at zero degree Aries which was so, **at the time of Kali Yuga** according to tradition and reiterated by Indic astronomers of the past. The simulation done with this correction based on Surya Siddhanta for the Panchanga features of Janamejaya grant is as follows:

Body	Longitude	Nakshatra	Pada	Rasi																			
Lagna	29 Pi 09' 13.04"	Reva	4	Su				Mo				Ma				Ke							
Sun - PiK	7 Pi 45' 47.67"	UBha	2	Me				Sa								Ma							
Moon - PK	5 Pi 00' 59.51"	UBha	1					A11								A7							
Mars - MK	10 Ge 31' 36.21"	Ardr	2					Rasi															
Mercury - AK	22 Pi 30' 52.44"	Reva	2																				
Jupiter (R) - DK	0 Li 14' 55.41"	Chit	3																				
Venus - AmK	20 Cp 43' 49.26"	Srav	4																				
Saturn - GK	1 Ar 49' 29.80"	Aswi	1																				
Rahu - BK	17 Sg 21' 06.93"	PSha	2																				
Ketu	17 Ge 21' 06.93"	Ardr	4																				
Date: December 31, -3013																							
Time: 8:00:00 am																							
Time Zone: 5:30:00 (East of GMT)																							
Place: 76 E 28' 00", 15 N 20' 00"																							
Hampi, India																							
Lunar Yr-Mo: Plavanga - Phalguna																							
Tithi: Amavasya (Ra) [Chitra]																							
(22.89% left)																							
Vedic Weekday: Monday (Mo)																							
Nakshatra: Uttarabhadra (Sa)																							
Ayanamsa: 1-20-02.34																							
Sunrise: 6:50:24 am																							
Sunset: 6:29:19 pm																							

Figure 20: Simulated to Sri Surya Siddhanta ayanamsa

Note two major changes: (1) Amawasya was there at sunrise (2) Sun is at 8th degree Pisces whereas in the previous simulation (on current Ayanamsa) it was at 25th degree of Pisces. The modern calendar date has regressed by 28 days in the above simulation, but the Panchanga features had not changed at all. Nearly a month-long difference is there between current and the changed ayanamsa for the same Panchanga features. The planetary positions also had changed.

This must be an eye opener for all the researchers working on dating the past from astronomy simulators having no ayanamsa correction for the Vedic sidereal positions and no scope for knowing the Panchanga features. **WHEN THE AYANAMSA DEGREE CHANGES, THE PLANETARY POSITION ALSO CHANGES.** The one using astronomy simulator hoping to date a past Indic event will be in reality just groping in the dark with no idea of whether he /she had landed up with the correct weekday, tithi and year name for a given star or solstice or equinox or planetary position. *Only Panchanga features coupled with the correct ayanamsa offer the reality check of the date* which the Gregorian or the Julian calendar dates of the astronomy software do not give.

With the Panchanga features of the date of Janamejaya-grant synchronising with each other in the above simulation set to Sri Surya Siddhanta (SSS) ayanamsa, we can rest assured of the **authenticity of the grant** that was given on the last day of Plavanga year. Has Niles Oak shown at any place in his book or blog a synchronisation of even three Panchanga elements

for any of the dates he had deduced either conceptually or through his Voyager Simulator Nyaya?

- If Nilesh Oak's date of Mahabharata is true, then Parikshit ascended the throne in 5526 BCE (35 years later), ruled for 60 years, to be succeeded by Janamejaya in 5466 BCE. In the 29th year of Janamejaya, i.e. 5437 BCE the year name was Subhanu, not Plavanga as given in the inscription.
- In the present context it is made clear that the Janamejaya inscription is true, as the Panchanga details of the day fall in place tallying with the 89th year of Kali Yuga. The mention of Yudhishtira Shaka in the inscription should put to rest any doubts on the Shaka name after Yudhishtira.
- Calendars based on the dates of Buddha and Mahavira were there at the time of Vikrama and Shalivahana Shaka, but they were conceptually different. Shaka based time reference is found in Hindu (Vedic) calendars. The inscriptions of Hindu rulers recorded time from the nearest Shaka.
- From Yudhishtira to Vikrama, the gap was 3044 years. $(3101 - 57 = 3044)$ (Abul Fazl recorded this). So the number 3044 is treated as a constant to convert a year of Vikrama Shaka to Kali Yuga.
- In the case of Shalivahana Shaka that started in the year 78 CE, a fixed number, 3179 is added to get the Kali year, because of the gap of 3179 years $(3101 + 78)$ between Yudhishtira / Kali Yuga start date and Shalivahana. Bhaskara II, the author of Siddhanta Shiromani has recorded this number 3179 in his book besides giving the number of years that elapsed since the beginning of Kalpa until the beginning of Shalivahana Shaka - a calculation that includes 3179 in the Kali Yuga period until the Shaka beginning. He has even given his birth year in Shalivahana years as 1036.³⁰² This corresponds to $1036 + 3179 = \text{Kali } 4215$.

Without knowing this basic feature, Nilesh Oak ridicules the addition of 3179 as circular logic!

Nilesh Oak makes a wrong statement attributing the derivation of this number (3179) to Aryabhata that he "calculated $3600 - 421 = 3179$ (before Shaka), which is same as 3101/3102

³⁰² "Siddhanta Shiromani" translated by Pandit Bapu Deva Sastri, Chapter 13-58

BCE.”³⁰³ Aryabhata had never written that. In fact Aryabhata does not mention any date of any Shaka.

The Aryabhata-headache of Nilesh Oak.

Before he happened to read the Puranic justification of the Kali Yuga date for the first time³⁰⁴ in 2016, Nilesh Oak was seen training his guns at ancient stalwarts like **Aryabhata** and **Garga** thinking that they had erroneously computed the Kali Yuga date at 3102 BCE.

Initially, i.e. in 2014 he found fault with the researchers for interpreting Aryabhata’s verse on his age based on traditional Kali Yuga date.³⁰⁵

(1) One of the verses from Arayabhatiya (astronomy treatise) of Aryabhata states that Aryabhata was 23 years old when 3600 years of Kali-Yuga has elapsed.

Many researchers employ above reference to infer that therefore Aryabhata was written in year 499 CE and that Aryabhata was born in 476 CE. However these researchers do not tell us from where they acquire this assumption of 3102 BCE as the beginning of Kali-Yuga, if that very information was used to decide the timing of Aryabhata (or timing of composition of Aryabhata).

Then within three months, he started thinking³⁰⁶ that

- “It appears **Aryabhata attempted** to estimate the timing of the beginning of Kaliyuga (and thus Mahabharata)”
- **Aryabhata assumed zero ayanamsa for Kaliyuga** begin date and also during his time, perhaps based on the erroneous Sapta Rishi calendar (erroneous because the Sapta Rishis don’t move with respect to nakshatras of the ecliptic)
- Aryabhata interpreted a statement from Surya Siddhanta that one complete round of ayanamsa takes 3600 years.

All the above views of Nilesh Oak are the opinions of the commentators, and not of Aryabhata. Aryabhata doesn’t talk about Sapta Rishi calendar either. Obviously Nilesh Oak has taken up ideas from some secondary texts without knowing what they mean.

Nilesh Oak’s problem with Aryabhata is such that *Aryabhata has stated his age in terms of Kali Yuga which works out at 3577 years since the inception of Kali.* It is absolutely difficult to fit this in Nilesh Oak’s time line. Nilesh Oak could have claimed that Kali Yuga started 35 years

³⁰³ Beginning of Kali-Yuga – Assertions & Chaos: Part 2

<https://nileshoak.wordpress.com/2014/03/24/beginning-of-kali-yuga-assertions-chaos-part-2/>

³⁰⁴ Nilesh Oak’s references from Puranas on computation of Kali Yuga appear from 2016 only in his blog posts.

³⁰⁵ Beginning of Kali-Yuga – Assertions & Chaos: Part 1

<https://nileshoak.wordpress.com/2014/01/17/beginning-of-kali-yuga-assertions-chaos-part-1/>

³⁰⁶ Beginning of Kali-Yuga – Assertions & Chaos: Part 2

<https://nileshoak.wordpress.com/2014/03/24/beginning-of-kali-yuga-assertions-chaos-part-2/>

after his Mahabharata date, i.e. in 5526 BCE (5561 -35) and deducted 3577 years from that to locate Aryabhata at 1949 BCE. He is not able to do it, nor is he able to deduce a date of Kali Yuga. THE RESULT IS TO ATTACK THE EXISTING TRADITION OF KALI YUGA DATE FROM

ANGLES THAT NO PERSON WITH EVEN MARGINAL EXPOSURE TO THE WORKS OF ARYABHATA WOULD DARE TO DO.

Till the time of writing this, there is no evidence that Nilesh Oak is aware of not just one, but three clues on Kaliyuga date at various places in Aryabhatiya.

Aryabhata on Yuga, Bharata and Kali Yuga

In his first chapter on 10 **Gitika verses** that he proclaims to be capable of making the knower (of those verses) reach the Supreme Brahman, Aryabhata had given two clues on Yuga.

In the 3rd and 4th verses, he has given the number of revolutions of the planets that “commenced at the beginning of the sign **Aries** on **Wednesday** at sunrise at Lanka”³⁰⁷

This is variously interpreted by commentators, but the number of revolutions given for the Sun in that verse is 43, 20,000 and this is valid only for the Chatur Maha Yuga that started with Krita Yuga. Therefore this verse implies that **Krita Yuga started on a Wednesday with all the planets at the beginning of Aries**. In the next verse (no 5) he refers to the elapsed Yugas at “Bharatāt Purvam”!

काहो मनवो ढ, मनुषु-
गाः^१ रख, गतास्ते च, मनुषुगाः^२ छना च ।
कल्पादेर्युगपादा
ग च, गुरुदिवसाच्च, भारतात् पूर्वम् ॥ ५ ॥

5. A day of Brahmā (or a Kalpa) is equal to (a period of) 14 Manus, and (the period of one) Manu is equal to 72 yugas. Since Thursday, the beginning of the current Kalpa, 6 Manus, 27 yugas and 3 quarter yugas had elapsed before the beginning of the current Kaliyuga (lit. before Bhārata).

The above is the translator’s version, but the verse refers to the lapse of 6 Manus, 27 Yugas and 3 quarter Yugas on a Thursday at “**Bharatāt Purvam**.”

The three quarter padas refer to the first three yugas of the Chatur Maha Yuga. Coming after the verse on Chatur Maha Yuga, one can expect this to be about the beginning of the 4th Yuga, i.e. Kali Yuga. But then why did he use the term Bharatāt Purvam instead of Kaliyugāt Purvam? Let me give two explanations.

³⁰⁷ “Aryabhatiya of Aryabhata” edited and translated by Kripa Shankar Shukla, Page 6

(1) ‘**Bhāratāt Purvam**’ has been interpreted by ancient commentators such as Bhaskara I and Suryadeva, as referring to before the time when Yudhishtira of Bharata dynasty relinquished the throne. This could be a reference to the traditional Kali Yuga date given the fact that Yudhishtira came to know of the exit of Krishna only after seven months.

The sequence of events given in Mahabharata shows that on the seventh day after Krishna’s exit, Arjuna left Dwaraka along with the remaining population and settled them down in different places. Then he went to the hermitage of Vyasa to convey the exit of Krishna. Taking the advice of Vyasa that the time had come for him and his brothers to leave the earth, Arjuna returned to the Kuru kingdom to meet his brothers. This happened **seven months after he left**, says Srimad Bhagavatam.³⁰⁸ Therefore the reference to ‘**BHĀRATĀT PURVAM**’ IS A **DATE FROM BEFORE THE BHĀRATA (PANDAVAS) RENOUNCED THEIR THRONE**. Krishna’s exit was the only important event before the renouncement of the throne – an event that prompted them to renounce.

Aryabhata had succinctly conveyed that event (the day of exit of Krishna) while giving the time-lapse at that time as the marker for the start of Kali Yuga. The mention of **Thursday** in that context as the weekday when the new Yuga started is further proof of meticulous calculation of Time and the record and remembrance of the same.

(2) According to another ancient commentator Somesvara, ‘Bhāratāt Purvam’ refers to the **first day of the Bharata war!** Kali almost started on the day of the war that was unjustifiably fought by refusing to honour the agreement to give back the kingdom to the Pandavas at the end of their exile. However this is not acceptable given *the time lapse mentioned in the verse that fits with the beginning of Kali Yuga*.

This chapter being designed to give basic aphorisms, one can expect Aryabhata to give the universal view on the basics, such as the beginning of Kali Yuga. But by using the expression ‘Bharatāt Purvam’ he may have given a clue on the weekday of the first day of the war which also happened to be the same week day on the first day of Kali Yuga. This will be justified as we progress with this analysis.

Kali Yuga Date derived from Aryabhatiya.

The third reference to Yuga comes in the 3rd chapter on *Kalakriya Pada* that exclusively deals with time.

³⁰⁸Srimad Bhagavatam: 1-14-7

युगवर्षमासदिवसाः समं प्रवृत्तास्तु¹ चैत्रशुक्लादेः ।
कालोऽयमनाद्यन्तो ग्रहभैरनुमीयते क्षेत्रे ॥ ११ ॥

Verse 11]

BEGINNING OF YUGA ETC.

99

11. The *yuga*, the year, the month, and the day commenced simultaneously at the beginning of the light half of Caitra.¹ This time, which is without beginning and end, is measured with the help of the planets and the asterisms on the Celestial Sphere.

He has given the name of the month and the phase (Shukla) but left out the Yuga name. It is not difficult to assume that it is Kali Yuga (the entire chapter is on computations pertaining to Kali Yuga) and the year was PRAMATHI. Most of the inscriptions found in North India refer to Pramathi as the start of the counting of years in Kali Yuga. In South India it is PRABHAVA, the reason being, the year clock was set back to the first year of the 60-year cycle for counting the years from Kali Yuga start date. This difference in North – South traditions has no justification except that *North India retained continuity, while Southern tradition went back to the first year of the cycle*. That is, when *Pramathi* was running, it was *Prabhava* in the South and this continues till date. The switch over happening in Pramathi signals that some event had happened in Pramathi that caused a new cycle. And that event WAS THE EXIT OF KRISHNA. THE 36TH YEAR BEFORE THAT WAS THE YEAR NAME OF MAHABHARATA WAR. That happens to be Year Krodhi. The year name Krodhi must concur with the other Panchanga details for deducing the time of Mahabharata war.

In the present context the week day and the star of the day are not given. The week day seems to have been taken for granted in the verse and this makes me think that it must be Thursday based on the verse in the 1st chapter discussed earlier. When these **four** Panchanga details (Pramathi, Chaitra, Shukla paksha beginning / Pratipat and Thursday) were checked in the astrology software, it gave a remarkable concurrence for the date 22nd January, 3101 BCE! That is the day from which Kali Yuga is calculated!

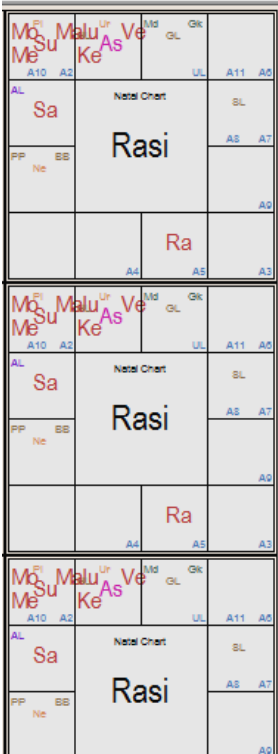
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Figure 21: Kali Yuga date simulated to (current) Chitra-paksha ayanaamsa

The same Panchanga details simulated for Sri Surya Siddhanta ayanaamsa (SSS) gives the same date but Sun was at 2nd degree of Aries!

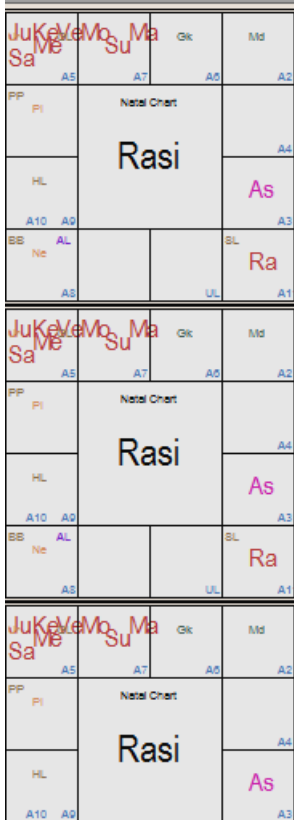
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Jupiter - MK	27 Pi 52' 42.86"	Reva	4																																																																								
Venus - AmK	28 Pi 37' 30.14"	Reva	4																																																																								
Saturn - BK	28 Pi 09' 01.54"	Reva	4																																																																								
Rahu - GK	28 Vi 29' 33.41"	Chit	2																																																																								
Ketu	28 Pi 29' 33.41"	Reva	4																																																																								
Date:	January 22, -3101																																																																										
Time:	4:00:00 pm																																																																										
Time Zone:	5:30:00 (East of GMT)																																																																										
Place:	75 E 46' 00", 23 N 11' 00"																																																																										
	Ujjain, India																																																																										
Lunar Yr-Mo:	Pramathi - Chaitra																																																																										
Tithi:	Amavasya (Ra) [Chitra]																																																																										
	(12.04% left)																																																																										
Vedic Weekday:	Thursday (Ju)																																																																										
Nakshatra:	Aswini (Ke)																																																																										
	(97.54% left)																																																																										
Yoga:	Vishkambha (Sa) (84.24% left)																																																																										
Karana:	Naga (Sa) (24.08% left)																																																																										
Ayanamsa:	0-00-00.05																																																																										
Mahakala Hora:	Sun (5 min sign: Ao)																																																																										

Figure 22: Kali Yuga date simulated to Sri Surya Siddhanta ayanamsa (zero degree Aries).

The date in modern calendar is remarkably the same in figures 3 and 4 for current and SSS ayanamsa. However in Figure 22, all the planets are at close degrees behind the Sun with Mars alone within 5 degrees in front of the Sun. **THIS IS A REMARKABLE CONCURRENCE WITH THE TRADITIONAL VERSION AND THE MARKER FOR THE START OF A YUGA WHEN ALL PLANETS WOULD BE TOGETHER NEAR THE BEGINNING OF ARIES WHILE VERNAL EQUINOX WOULD BE AT ZERO DEGREE ARIES.**

Compare this with the findings we made in the **Chapter on Equinoxes**. We found that Uttarayana was at 0.27° Capricorn during Mahabharata based on the average rate of precession (66.66 years per degree of precession /progression) calculated from Surya Siddhanta. Ninety degrees to the east of it is Vernal Equinox (Vishu), at 0.27° Aries. This concurs with the tradition that the ayanamsa was at zero degree Aries during Mahabharata. **THE SURYA SIDDHANTA BASED AYANAMSA** (used in simulating the above chart) is close to the ayanamsa of Kali Yuga date and therefore **HIGHLY RELIABLE FOR DATING MAHABHARATA EVENTS.**

In Figure 21 for Chitra Paksha Ayanamsa (current) the Panchanga details were the same, but planetary positions were different, particularly that of the Sun. **The ayanamsa was at 313 degrees in the zodiac (in precession).** *This is 45 degrees short of 360 degrees thereby placing Kali Yuga at Taurus 15 degrees.* Now readers can know the havoc of not using the exact ayanamsa for dating. When the correct ayanamsa and Panchanga details match, all the planetary positions automatically match. That it is not possible to get all the planetary positions right without the correct ayanamsa is what Nilesh Oak and others engaged in this kind of dating research using astronomy software, have not yet realised.

The difference of nearly a month in **Janamejaya grant** issued at 89th year after the above Kali Yuga date in the two simulations, one on chitra Paksha ayanamsa and another on Surya Siddhanta ayanamsa, can be better understood now. On **Kali Yuga date** (January 22, 3101 BCE) the ayanamsa was at zero degree Aries in SSS settings. After Kali Yuga began, the ayanamsa moved forward in SSS whereas it was always in backward motion in the Chitra Paksha settings. As such the ayanamsa was 1-20 degree (at Aries) in SSS settings at the time of Janamejaya whereas it was 314-37 degree (in Pisces) in the settings of Chitra Paksha. This is so in the western astronomy software too. Between SSS (Surya Siddhanta) and Chitra Paksha the difference was 313 degrees of the zodiac in precessional direction. The same can

be re-phrased as a gap of 45 degrees between 314- 37 (Chitra Paksha) and 1-20 degrees (SSS). This gap in ayanamsa accounted for a month and a change in the position of the planets. Now one can imagine the havoc of vast difference that the changed ayanamsa can cause in dating an event.

It cannot be denied that the Panchanga features synchronise for the date **JANUARY 22ND, 3101 BCE.** This combination repeats along with the same planetary positions only once in a Yuga. **THE NEXT TIME THE AYANAMSA WAS AT ZERO DEGREE ARIES WAS ON 21ST MARCH 499 CE DURING ARYABHATA'S TIMES.** But then the planetary combinations were different, so also some of the Panchanga features. Though the year was Pramathi, as in Kali start date, other Panchanga features were different. Aryabhata was 23 years of age at that time.

Kali Yuga date deduced from Aryabhata's age

A verse in the third chapter of Aryabhata, giving the age of Aryabhata fixes the year of Kali Yuga 3600 years before his date. By using the term 'Yuga pādā' to refer to the lapse of the three previous yugas (Krita, Treta and Dvapara), Aryabhata has made a clear statement on the date of Kali Yuga.

षष्ट्यब्दानां षष्टिर्यदा व्यतीतास्त्रयश्च युगपादाः ।

अधिका विंशतिरब्दास्तदेह मम जन्मनोऽतीताः ॥ १० ॥

10. When sixty times sixty years and three quarter yugas (of the current yuga) had elapsed, twentythree years had then passed since my birth.

Sixty times the sixty years are 3600 years that Aryabhata recognises as the time elapsed since the beginning of Kali Yuga when he was 23 years of age. Scholars had debated in the past on why Aryabhata mentioned his age from Kali Yuga beginning. The basic reason is that any **TANTRA SIDDHANTA**³⁰⁹ must refer to time starting from the nearest Yuga, which is Kali Yuga in the case of Aryabhata. The oft repeated justification by commentators is that at 3600 years after Kali Yuga date, the mean position of the planets given by Aryabhata in the first chapter required no correction with zero rate of precession running at that time! This means that the tropical vernal equinox coincided with the sidereal equinox at zero degree Aries at his time. This conjunction happens at the beginning of every Yuga which means similar conjunction or

³⁰⁹Jyothisha Siddhanta is divided into three parts - Siddhanta, Tantra and Karana. The Siddhantic text presents calculations starting from Kalpa. The Tantra text deals with calculations starting from the nearest Yuga. The Karana text gives the calculations from the nearest Shaka year. Aryabhata is a Tantra text which is further authenticated by the title of the commentary "Aryabhata Tantra Bhashya" by Bhaskara I.

zero ayanamsa had happened 3600 years before Aryabhata's date! (Figure 23)

	Body	Longitude	Nakshatra	Pad
	Lagna	2 Cr 07' 15.35"	Puna	4
	Sun - DK	0 Ar 07' 12.25"	Aswi	1
	Moon - BK	17 Sg 22' 17.70"	PSha	2
	Mars - PK	11 Ar 46' 24.32"	Aswi	4
	Mercury (R) - MK	12 Pi 57' 27.67"	UBha	3
	Jupiter (R) - GK	2 Li 41' 28.30"	Chit	3
	Venus - AK	23 Pi 30' 27.24"	Reva	3
	Saturn - AmK	19 Ta 17' 37.22"	Rohi	3
	Rahu - PiK	17 Pi 10' 55.84"	Reva	1
	Ketu	17 Vi 10' 55.84"	Hast	3
	Date:	March 20, 499		
	Time:	12:00:00 pm		
	Time Zone:	5:30:00 (East of GMT)		
	Place:	75 E 46' 00", 23 N 11' 00" Ujjain, India		
	Lunar Yr-Mo:	Pramathi - Chaitra		
	Tithi:	Krishna Saptami (Sa) [Siva Dooti]		
		(56.24% left)		
	Vedic Weekday:	Friday (Ve)		
	Nakshatra:	Purvashadha (Ve)		
		(69.71% left)		
	Yoga:	Siva (Me) (68.81% left)		
	Karana:	Vishti (Sa) (12.47% left)		
	Ayanamsa:	0-00-00.30		
		Makara Sankranti - Makar Sankranti		
		Makar Sankranti - Makar Sankranti		
		Makar Sankranti - Makar Sankranti		

Figure 23: Zero ayanamsa in 499 CE (SSS based)

This is a clinching evidence for the Vedic concept of equinoxes (explained earlier) that it does not go permanently in backward motion, but come back to the beginning of Aries every 3600 years.

The Sun's entry into Aries happened on Chaitra Krishna Saptami in the year Pramathi, when the moon was at Purvashadha. The date was 499 CE in Gregorian calendar. The ayanamsa being zero degree, the tropical vernal equinox had coincided with sidereal Sun at zero degree Aries on this date. The mean positions of the planets given by Aryabhata are found to hold good for zero degree ayanamsa. *Sensing the importance of this rare date Aryabhata had produced his Siddhanta.* The reference to Kali Yuga exactly 3600 years prior to this date endorses the view of Surya Siddhanta on oscillating equinoxes

Kali Yuga did start on a Thursday

The same verse on Bhāratāt Purvam states that Kali Yuga started on a **Thursday**. Today all the available calculations to derive a day in Kali Yuga finally ends up with **dividing the derived number by 7**, and the weekday enumerated from the remainder starting from **Friday**. If the remainder is zero, the week day is Friday, if it is one; the day is Saturday and so on. This deduction is possible only if the conjunction of the planets happened on a Thursday. The unstated fact of this deduction is that *Kali Yuga started on a specific day that is neither fictitious nor changeable.*

Yet another inviolable feature connects the weekday with solar ingress in Aries. The weekday advances at the rate of one day per year – where the year is calculated in terms of days, Ghatis, vighatis and vipalas taken by the sun to come back to the same position at zero degree Aries. For instance, if the solar ingress in Aries occurs on a Monday in a year, it will occur on Tuesday the next year, on Wednesday the year after, and so on. However, with extra hours piling up, the weekday will progress by two every fifth year. That is, **if Monday is the weekday in the first year**, it will progress by a day for the next four years, with Thursday becoming the weekday on the first day of the 4th year. **On the fifth year the weekday will not be next in succession (Friday) but it will be Saturday.**

This progression is based on another rationale that if the solar ingress occurs at day time, the weekday at sunrise is taken into account. If the ingress occurs at evening or night, the next day is taken as the first day of the year. The implication of this relationship between the weekday and the first day of the solar year (entry into Aries) is such that the first day of Kali Yuga is an established one. *If Kali Yuga started on some other day or date, today cannot be what we see in the calendar.* The solar ingress is a cosmic fact that none can change. That movement coinciding with specific weekday is proof of inviolability of Kali Yuga begin- date. This relationship between the year beginning and the running weekday at that time does not allow any tampering with the Kali Yuga date. The date is fixed and unalterable.

While this establishes the genesis of the week-day concept in the Vedic society, as part of its system of time keeping, it also shows that Aryabhata must have meant the Bharata war in the verse on ‘**Bharatāt Purvam**’. There was no need to specifically say the week day for the Kali Yuga as it was a foregone knowledge among astronomers of his time since the calculation of the week day of every New Year day is based on the aphorism that the weekday is a progression from Friday. By the specific mention of Thursday on “Bharatāt Purvam” Aryabhata has made it known that Mahabharata war commenced on a Thursday.

The sorry tale of Nilesh Oak’s research is that he is oblivious of this and too many other features around the traditional date of Kali Yuga that closely followed Mahabharata events.

The next major issue raised by Nilesh Oak is about the **Sapta Rishi cycle**. The rationale and computation of the Sapta Rishi Yuga cycle has remained a puzzle among scholars. Nilesh Oak, drawing inputs from secondary sources, has dared to accuse Garga and Aryabhata as having derived the date of Kali Yuga from the ‘erroneous’ Sapta Rishi cycle.

Evidence of Kali Yuga date in Saptarishi cycle.

The Saptarishi cycle comes into reckoning in the discussion on Kali Yuga date for two reasons. According to all available versions, the **Sapta Rishi cycle started 25 years after the start of Kali Yuga**. This offers excellent cross- reference to validate the Kali Yuga date. The second reason can be traced to a specific verse in **Brihat Samhita** on the location of the Saptarishis in the time scale of Yudhishtira Shaka. The verse says,

“During the reign of Yudhishtira 2526 years before the commencement of Vikrama Shaka the seven sages were at the constellation of Magha.”³¹⁰

This helps in zeroing in on the date in the time scale of Kali Yuga and from there tracing the beginning of Saptarishi Era. The gap between Yudhishtira and Vikrama Shaka being 3044 years, this date corresponds to Kali / Yudhishtira Shaka 518 (3044-2526). *This was mistaken as the beginning year of Yudhishtira Shaka by some.*

Starting from the basic features of the Saptarishi cycle, the Saptarishis are said to go round the 27-star zodiac by crossing each star in 100 years. This gives the **overall cycle of 2700 years**. In astronomy terms this cannot be actual movement, but only hypothetical movement with actual time in application. The calculation can only be mathematical. Any reference in any text on visual sighting of the Saptarishis at a particular star is therefore untenable.

Any cycle around the zodiac = $360^\circ = 27$ stars.

Time to cross 27 stars / $360^\circ = 2700$ years.

Time to cross 1° of the cycle = 7 and half years (2700 % 360).

This *cycle started at Kali 25 years*. At Kali 518 the Saptarishis were at Magha. By a simple calculation of assigning 100 years for crossing each star the Saptarishis must have been at the star **MRIGASHIRSHA** in the beginning of Kali Yuga. From Mrigashirsha to Aslesha 5 stars and 500 years will be crossed. The next star is Magha. This is based on the presumption that the cycle is *clockwise*. Therefore we have first to check the movement of the cycle, whether clockwise or anti clockwise.

From among various references on the location of Sapta Rishis, one stands out enabling us to find out the direction of the movement of Sapta Rishis in its time-cycle. This appears in Pargiter’s compilation of chronological and astronomical particulars from **Vayu Purana** and

³¹⁰ ‘The Brihat Samhita’ translated by N.C. Iyer, Ch 13-3

highlighted by **Kota Venkatachelam**. Venkatachelam has pointed out³¹¹ how Pargiter had amended the verse from “*agnina samah*” to “*Pushye*.”³¹² The original verse says that the Sapta Rishis were in Kritika (Agni star) at the time of birth of Parikshit, i.e. soon after the Mahabharata war. Pargiter has changed it into Pushya and this has been picked up by others.

At the outset this puts at rest the uncertainty about the direction of Sapta Rishi movement.

THE DIRECTION IS CLOCKWISE. *In Kali 518, the Sapta Rishis were at Magha but they were at Kritika at the time of birth of Parikshit.* Parikshit was born after the war was over, probably in the next year of the cycle, i.e. **Viswavasū**. Between Kali and Pariskhit’s birth the gap was 35 years. Let’s add it to Kali 518 to get the duration that Saptarishis had travelled from Kritika to Magha.

$$518 + 35 = 553 \text{ years}$$

The degrees travelled by Sapta Rishis through 553 years

$$= 553 / 7.5 \text{ (7.5 years} = 1^\circ \text{ of movement of Sapta Rishi)}$$

$$= 73.73^\circ$$

Since Magha occurs at the beginning of Leo, going backward by 73.73° means the Saptarishis were at Taurus 16.27°

Till Taurus 10° = Kritika.

At 16.27° = Rohini.

There is a difference of 6.27° from Kritika equal to approximately 45 years of Sapta Rishis time. This is equal to two pada³¹³ of Rohini or mid-point of Rohini. As per this calculation when Parikshit was born, the Sapta Rishis had moved from Kritika to Rohini. However the main issue remains whether the Era started at Kali 25.

Saptarishi Era at Kali year 25.

With the certainty about directional movement of the Sapta Rishis being clockwise, it is possible to locate the beginning point of the Sapta Rishi cycle 25 years after the start of Kali Yuga.

From the earlier equation we derived:

$$\text{Yudhishtira Shaka 518} = \text{Sapta Rishis at Magha.}$$

³¹¹Kota Venkatachela Paakayaaji, “Chronology of Ancient Hindu History” Part 1, Page 206

³¹²F.E.Pargiter, “The Purana Text of the Dynasties of the Kali Age.” Page 59

³¹³1 pada of a star = $3^\circ 20'$

Deducting 25 years = 518- 25= 493

Sapta Rishi cycle began 493 years before it entered Magha.

The distance in degrees for 493 years = 493 / 7.5 (@ 1 degree)

=65.73°

This is the distance travelled by the Sapta Rishis since the beginning of the cycle till they reached Magha (zero degree Leo)

This puts THE BEGINNING AT TAURUS 24.27°, exactly at the BEGINNING OF THE STAR MRIGASHIRSHA³¹⁴ (Deer's head) at the 2nd degree, to be precise. Starting from this, the Saptarishis will be in the 2nd degree of Magha in the Yudhishtira Shaka year 518. The star Mrigashirsha signifies 'path', the *Mārga* of the Universe. Conceptually this concurs well with the idea of Sapta Rishi that they lead mankind in the Universe. Among the months, Krishna identified himself with Mrigashirsha.³¹⁵ Culturally celebration of *Full Moon in Mrigashirsha in Kashmir where Saptarishi Era* was followed in olden days adds credence to the beginning of this cycle at Mrigashirsha³¹⁶ in the solar month of Margashira.

This also solves the mystery around "AGRAHĀYANA" which means "*first movement*" (Agra = first, ayana = movement) occurring at Mrigashirsha. The 'first movement' was about the beginning of the cycle of Saptarishi Yuga at Full Moon in Margashira. This puts at naught the view that Agrahāyana could refer to the equinox. THE OSCILLATING EQUINOX CANNOT GO BEYOND KRITTIKA 1ST PADA. Agrahāyana being the other name for the month of Margashira, its importance as the first one is known from the Saptarishi Era. The yearly celebration of the Full Moon in Margashira in Kashmir marks the day as the New Year day and the month as the first month in the Saptarishi Calendar.

The Era starting with the Saptarishis at the star Mrigashirsha in Kali year 25 offers yet another evidence of the inviolability of Kali Yuga date at 3101 BCE.

³¹⁴The star Mrigashiras begins at 23° 20' in Taurus.

³¹⁵Bhagavad Gita: 10- 35

³¹⁶ Mrigashiras represents the eye of the "Nakshatra Purusha" – a concept of 27 stars of the zodiac making the body of Vishnu (Brihat Samhita: 105-4).

The month of Margashirsha represents the first name of Vishnu as Kesava among His 12 names. Krishna identified himself with this month in Bhagavad Gita. Such primacy to Margashirsha when Full Moon occurs in Mrigashiras can be traced to Saptarishi cycle!

Epigraphic evidence for Kali Yuga date.

The evidence of Kali Yuga date in epigraphy is very less. The reason can be traced to the fact that engraving on stones came into vogue only after the beginning of the Common Era. The records of olden times inscribed on leaves and metals had suffered easy destruction. The inscriptions on metals were always in the custody of the private persons and were lost in due course. Only stone inscriptions have withstood the vagaries of time.

By the time stone-inscriptions were gaining popularity, the Shalivahana Shaka Era was started in the year 78 CE and it is continuing. Any year in the Shaka Era would be counted from the beginning of that Era. This Era having started 3179 years after Kali Yuga, it became easy to convert any year of the Shaka Era into Kali Year by adding 3179 to the Shaka year. Verses in Tamil attributed to Siddhas do refer to adding a constant, 3179, to the Shaka year to get “**Kali-Yugābda**”.³¹⁷ This calculation came into existence only because the Kali Yuga date was well established beyond doubt. The Shaka year establishes the **KALI DATE AT 3101** BCE (3179 – 78 CE = 3101 BCE).

With most inscriptions on stone made in the current Shaka, we get to see only few inscriptions with Kali date. For instance **Polasara** plates of Arkesvara Deva of Ganjam³¹⁸ is dated at “Yugāvda 4248” that corresponds to 1147 CE (4248 – 3101). **Pottesvara temple** inscription of Bhanudeva III of Imperial Ganga Dynasty³¹⁹ traces the date at Kali 4477 (1376 CE). The **Parthivasekara puram** inscription traces the date in Kali days since the Yuga began.³²⁰

One of the inscriptions of the early part of Kali Yuga recorded by **Francis Buchanan**³²¹ in his travelogue and delivered to the Bengal Government was originally found in **Madugeswara temple** at Banawasi, in North Canara district. It refers to a grant of land to God Maducanata by Simhunna Bupa of Yudhishthira’s family dated at Yudhishthira Shaka 168.

Yet another inscription mentioned in the same book refers to a record³²² on palmyra leaves which was a copy of a copper plate inscription in possession of a sanyasi, dated at “**Kaliyugam 600**” in the reign of Raja Mulla, king of the South. A copy of that was delivered

³¹⁷Jothida Graha Chinthamani: Pages 4, 5.

³¹⁸Yugavda’ 4248 corresponding to 1147 CE (Source: https://shodhganga.inflibnet.ac.in/bitstream/10603/118658/6/06_chapter%201.pdf)

³¹⁹Jagabade Kaliyuga gate 4477’ corresponding to 1376 CE (Source: Same as above)

³²⁰Travancore Archaeological Series, Volume I, page 30.

³²¹“A journey from Madras through the countries of Mysore, Canara, and Malabar,...” by Hamilton, Francis, 1762-1829. Page 231

³²²Ibid. Page 411

to the Bengal Government. It is not known how many more inscriptions of the old had gone into the possession of the government of the colonial period and continue to remain undetected.

As of today only two inscriptions published in the Indian Antiquary³²³ offer scope to cross check the date deduced above (3101 BCE) or rather deduce the date of Kali Yuga. Other inscriptions only state the Kali year of the inscribed text. One is the [AIHOLE INSCRIPTION](#) of the Chalukya king Pulikesin II and the other is the grant issued by [KING JANAMEJAYA](#), son of Parikshit.

Evidence from Aihole inscription.

The Aihole inscription of the Chalukya king Pulikesin II has two components of time, one, pertaining to the years in Kali Yuga after the Mahabharata war and the other, the Shaka year of the grant. Confusion abounds in the former regarding a term mentioned therein. The term is '*Bhāratādāhāvāditah*' which is interpreted as 'beginning from the Mahabharata war'. However the date derived from the numbers given in the inscription does not tally with the date of Mahabharata that started 35 years before Kali Yuga (3101 BCE). **Kota Venkatachalam** interpreted this term to mean 'after the Mahabharata war'³²⁴ by not connecting the counting of years from the date of war. He also corrected a minor scribal error in the inscription from '*shateshu*' to '*gateshu*'. With this correction the inscription gives the date 3101 BCE that we established as the date of Kali Yuga.

Reading this inscription in the light of Aryabhatiya version of '[BHĀRATĀT PURVAM](#),' we are pleasantly surprised to see the similarity between the two. '*Bhārata*' in '[BHĀRATĀDĀHĀVĀDITAH](#)' is much like '*Bhāratāt Purvam*' that was interpreted by ancient commentators as referring to Bhārata (Pandavas) relinquishing the throne. The Bhārata renounced everything and cast off their sacred fires too. ³²⁵*Bhāratā dāha avādita* could refer to the sacrifice of the Bharata clan after coming to know of Krishna's demise (when Kali Yuga started). The time of Pulikesin II coming within 150 years of Aryabhata, this kind of reference to the start of Kali Yuga seems to be widespread in use. The other way of looking at it is that a powerful and prosperous king like **Pulikesin II** could have found it difficult to ascribe to the view that Kali was running in his country, much like Parikshit who detested the

³²³Pandit Kota Venkatachalam, (1991) "Age of the Mahabharata War" Page 46

³²⁴Pandit Kota Venkatachalam, (1991) "Age of the Mahabharata War" Page 51 to 54

³²⁵Mahabharata: 17-1-20

presence of Kali. Perhaps this made him pick out the alternate marker for the Yuga beginning, the sacrifice of the Bhāratā (Pandavas) on coming to know of Krishna's exit.

The first part of the inscription reads as “Trimshatsu (30) trisahasreshu (3000) Bhāratā dāha avādita / Sapta abda shatayukteshu (700) gateshu abdeshu panchasu (5)//

This adds up to 3735 years since the time the Bhāratā sacrificed everything.

The next part reads as “Panchāshatsu (50) Kalaukāle shattsu (6) panchashatāsu (500) cha / Samā su samatitāsu shakānāmapī bhubhujām”//

The number given here is 556 since the beginning of Shaka. The nearest Shaka being that of Shalivahana, the Gregorian date is derived by adding 78 (CE) giving the year 634 CE which is very much within the reign of Pulikesin II.

Combining the two parts of the inscription, in the Kalaukāle (Kali's Time) 634 years had elapsed in 3735 years which works out to **3101 BCE**. That was the time of Bhāratā dāha avādita and Bhāratāt Purvam.

This analysis done systematically by collection of data and selection of the most reliable data from that collection does lead us to reasonable conclusions. The above findings are falsifiable, to use Nilesh Oak's terminology of Karl Popper, and makes the calculation more rational.

Nilesh Oak's faulty understanding of Siddhanta (Indian Astronomy)

Kali Yuga date is Siddhanta based and with the 3rd Shaka Era in progress now, time computation is well laid out to be accurate to seconds. It involves only Gaṇita or mathematics and identifies time through mathematical calculation. To cite an example an inscription found at *Parthivasekara puram* in Kanyakumari district about a grant given to a Vedic learning centre records the date in number of days such as “*fourteen hundred thousand forty nine thousand and eighty seventh day having expired after the beginning of kali Yuga*”³²⁶

This points out to the 9th century CE when deducted from the traditional date of Kali Yuga. Cross-referentially the king in whose name this has been issued is also found to belong to the 9th century. The kind of computation in number of days found in this inscription is a special feature of Jyothisha Siddhantas.

The Siddhanta gives theoretical exposition of the rules and concepts of different features of astronomy and time computation. *The time period of the Siddhanta is given only mathematically*

³²⁶Travancore Archaeological Series, Volume I, page 30.

by calculating from the beginning of the Kalpa, the Maha Yuga or the Yuga at the time of composition of the Siddhanta. Without knowing this basic *lakshana* of Siddhanta, Nilesh Oak has attempted to ‘date’ an ‘update’ of Surya Siddhanta in an article³²⁷ and a video³²⁸ recently. This is being highlighted here to show the lacuna in his understanding of the fundamentals in arriving at a date.

Picking out a verse in Surya Siddhanta that says that when seen from a place situated at no-latitude (niraksha desa samsthana) i.e. at equator, the pole star (Dhruva tara) is at the horizon,³²⁹ Nilesh Oak has gone on to date the Surya Siddhanta (according to him, an update among many updates of Surya Siddhanta). Thinking that the verse refers to visual sighting of pole stars at the two ends (north and south) he ran his simulator to locate the time when pole stars were visibly present at the two horizons (north and south) and arrived at a date 12,000 BCE!

No Siddhanta gives a hint like this to find out the time of its composition nor does it give such a hint to derive any other date. Siddhanta being Gaṇita (mathematics), it only talks about calculations for deriving any time period.

The same idea of Surya Siddhanta used by Nilesh Oak to “date” Surya Siddhanta is also found in **Siddhanta Shiromani** by Bhaskara II, that “*a man situated on the equator sees both the north and south poles touching (the north and south points of) the horizon.*”³³⁰ Would Nilesh Oak accept that Bhaskara II also lived in 12,000 BCE?

There need not be a star present at the point, but the location is Dhruva, a fixed point. The Siddhantas mention this as a universal statement. The same idea can be seen in modern astronomy in the context of Declination. The **Wikipedia article on Declination** gives the same idea.³³¹ Can it be used for deciding the date of writing the article?

From another verse in Surya Siddhanta³³² Nilesh Oak has claimed to have deduced the **OBLIQUITY** at the time of sighting the pole stars at the horizons, using it as an additional hint to substantiate the date he got from the simulator. That verse tells about the maximum extent of one fifteenth part of the circumference of the earth, i.e. 24° that the Sun goes on either side of the equator (solstices). That is a standard statement and the calculation of rising periods,

³²⁷“Ancient Updates to Surya Siddhanta”, Nilesh N Oak and Rupa Bhatta, 19-03-2019

³²⁸<http://indiafacts.org/ancient-updates-to-surya-siddhanta/>

³²⁸<https://www.youtube.com/watch?v=bQNhQ7wxOvA&feature=youtu.be>

³²⁹Surya Siddhanta 12- 43 &44

³³⁰Siddhanta Shiromani. 3-48, Translation by Pundit Bapu Deva Sastri.

³³¹Declination <https://en.wikipedia.org/wiki/Declination>

³³² Surya Siddhanta 12-68

ascensional differences and other details are given for that limit. Bhaskara II mentions this in his book besides giving methods to derive the same for latitudes less than 24°N .³³³ *By Nilesh Oak's claims, Siddhanta Shiromani of Bhaskara II can also be traced to 12,000 BCE* by interpreting that the axial tilt was 24° when Bhaskara II wrote his Siddhanta.

This 'research' of Nilesh Oak exposes how he picks out his evidences or Basic sentences *without recourse to the admissibility of them* from the text. His first step is to interpret a verse in the way he thinks is right, without any background knowledge of the fundamentals. The next step is to check it in the simulator. Then the research is done. *The same pattern laid already in the discovery of the "Epoch of Arundhati" is replicated in other 'researches'.*

The Surya Siddhanta dating 'research' is highlighted here to expose how Nilesh Oak is woefully lacking in fundamentals. Be it the tradition of Arundhati or methodology of Popper or Patanjali or nimitta of Samhita or Siddhanta to understand the calculation of time, Nilesh Oak can be seen looking through a limited 'window' to claim success. His Epoch of Arundhati appears in one such limited window. It is revealed in the next chapter.

³³³Siddhanta Shiromani. 9-19 & 20

Chapter 11

THE MYTH OF THE 'EPOCH OF ARUNDHATI'

With a declaration at the very outset that

“If ‘Arundhati’ does not qualify as the most unambiguous astronomical evidence in determining the Mahabharata War, let’s stop talking about astronomical evidence in Mahabharata”³³⁴

Nilesh Nilkanth Oak begins to solve the ‘Mystery’ of Arundhati by means of **five experiments** in the 6th chapter of his book.

In the 1st experiment (Ex No 5) he *checked the east-west movement of Arundhati and Vasishtha in the sky by comparing PMA (Proper Motion Ascension) of the two*. Today Arundhati is to the east of Vasishtha. If Vasishtha was found to the east of Arundhati that would mean Arundhati went ahead of Vasishtha according to him. Such a probability would appear after 2 million years in future. So this was dropped and he started checking the north – south movement of the two stars. This is his 2nd experiment (Ex No 6) in which *he compared the PMD (Proper Motion Declination) of the two*. With no clear idea of what it means to be ahead or behind in the north- south movement, he arrived at a date, 20,200 BP (for 2010 CE as the base year) for the two stars attaining the same declination.

In 2009 CE, he got an opportunity to check the PMD in the astronomy software SkyGazer™ and Voyager™ and got the date 44,320 BP instead of his *“earlier crude calculations of 20200 BP”³³⁵*.

The next experiment (Ex No 7) was not an experiment at all but **A STRAIGHT REJECTION OF THE ‘SPECULATIVE’³³⁶ VIEW OF THE SCIENTISTS THAT ARUNDHATI GOES ROUND VASISHTHA IN 7,50,000 YEARS.** Acceptance of this view of the scientific community amounts to straight rejection of the concept of Arundhati moving ahead of Vasishtha, thereby making Nilesh Oak’s attempt a useless exercise. Expectedly Nilesh Oak rejected this scientific view.

³³⁴“When Did The Mahabharata War Happen?” Page 53

³³⁵Ibid. Page 64

³³⁶Ibid. Page 63

In the next experiment (Ex No 8) Nilesh Oak *compared the declination of the two stars, hoping that a reversal of the two (one overtaking the other in declination) could mean Arundhati ahead of Vasishtha*. But such a reversal was not detected by him.

He continued his next experiment (Ex No 9) by *comparing the Right ascension (RA) of the two stars by deducting RA of Arundhati from RA of Vasishtha*. This is positive at present. A negative value would mean that Arundhati went ahead of Vasishtha. And it did become negative sometime before 4000 BCE and upon checking with the SkyGazer he found Arundhati “walking ahead” of Vasishtha between 4508 BCE and 11091 BCE. He named this as the **‘EPOCH OF ARUNDHATI’** and proclaimed that Mahabharata war could not have happened ‘even a day late than year 4508 BCE’, thereby falsifying 96+% of all existing proposals for the Mahabharata war.³³⁷

But there was a hitch. *The SkyGazer showed a repeat of the same in the previous ‘cycle of precession of equinoxes.’* When he contacted the makers of the software (Carina Software) to know about the settings and assumptions behind the simulations, he was informed that their professional version, Voyager 4.5™ incorporates ‘proper motion’ of the stars, which is missing in the version that Nilesh Oak tried.

Nilesh Oak repeated his experiments in the newer version, i.e. Voyager 4.5™ and **FOUND THE ‘EPOCH OF ARUNDHATI’ IN THE CURRENT CYCLE AND AGAIN AFTER 11,000 YEARS**. *So the ‘Epoch of Arundhati’ is true and Mahabharata war had occurred within that Epoch*, so says Nilesh Nilkanth Oak.

Responding to a reader in his 2014 blog on how an event going on for years could give contemporariness for a time, he writes as follows besides stating the significance of this discovery.³³⁸

So I solved the problem. In a scientific jargon, it would not have mattered how long this phenomenon was occurring. It would also not matter by how much distance/separation, Arundhati was ahead of Vasishtha.

So before we get into additional exploration and explanations, it is important to realize that this discovery is a great breakthrough. It is revolutionary in its implications and various objections people have raised have no implication whatsoever on the ‘scientific’ nature of this discovery.

If Newton had discovered this and if people had put the above questions to him, he would have simply answered, “Hypothesis non Fingo” (in layperson’s language – I don’t know).

The discoverer is not required to answer these questions. One may claim that these concerns are real and they may be. But these new problems are in fact the result of the revolutionary discovery of ‘Epoch of Arundhati’ (11091 BCE – 4508 BCE).

³³⁷ Ibid. Page 66-67

³³⁸ “Arundhati –Vasistha (AV) Observation of Mahabharata”
<https://nileshoak.wordpress.com/2014/02/03/arundhati-vasistha-av-observation-of-mahabharata/>

No matter whether this ‘Epoch’ is really what Vyasa had referred to in the A-V verse, Nilesh Oak cannot be expected to answer a genuine question. At best the reader will get a Newtonian answer “Hypothesis Non Fingo”! The bottom line is **NILESH NILKANTH OAK IS GREATLY SATISFIED THAT HE HAD MADE A GREAT SCIENTIFIC DISCOVERY COMPARABLE WITH THE SCIENTIFIC GREATS LIKE NEWTON, GALILEO AND OTHERS.**

Now coming to his explanation for the placement of Arundhati to the west of Vasishtha during the ‘Epoch’, Nilesh Oak gives the following explanations.³³⁹

- “1. The precession of equinoxes, which result in the movement of the celestial North Pole, such that location of celestial North Pole made peculiar orientation with respect to relative positions of Arundhati and Vasishtha.*
- 2. Proper motions of Arundhati and Vasishtha also contributed to changes in Right Ascension and Declination in addition to the changes in the Right Ascension and Declination measurements of Arundhati and Vasishtha caused by the movement of the celestial North Pole.”*

The strange scientific discoveries of Nilesh Oak.

In addition to the claim of scientific discovery of the Epoch, Nilesh Oak has offered unique explanation for the phenomenon of the Epoch that no scientist or astronomer had ever thought of!

- In the 1st point above, Nilesh Oak moots the idea of the precession of equinoxes causing the movement of the celestial North Pole. Certainly a break-through discovery, yet to be validated by the scientific community, for, this is the opposite of scientific or logical thinking accepted universally. Precession of the axial tilt causes the precession of the equinoxes and not the other way round as told by Nilesh Oak repeatedly in his book and blogs.
- In the same point he says that the North Pole makes a peculiar orientation with respect to relative positions of Arundhati and Vasishtha. What is ‘peculiar orientation’? How did he measure it? What calculation did he do to prove that the North Pole made a peculiar orientation?
- The 2nd point gives two causes for the changes in RA (Right Ascension) and Declination, viz. Proper motion of the two stars and movement of the celestial North Pole.

³³⁹ “When Did The Mahabharata War Happen?” Page 67

- When I searched his book for the data on proper motion through years, there is none. On checking the Stellarium software, I found that there was no change in the proper motion of the two stars in the said Epoch and before and after.
- Almost all the simulations incorporating this pair in Sapta Rishi Mandala had shown them travel in common proper motion in the same direction for at least 30,000 years forward and backward of our current time.³⁴⁰
- The current thinking in scientific community is that the A-V stars share a common proper motion indicating that they are gravitationally bound. This works out to 7, 50,000 years in orbital rotation period of Arundhati around Vasishtha.³⁴¹ Niles Oak has rejected this in his Experiment No 7.
- The second reason is attributed to the movement of the celestial North Pole. Why and how this movement causes changes in RA and Declination is not explained by Niles Oak.
- Earlier in the 3rd chapter on Astronomy Basics that is largely based on Wikipedia articles, Niles Oak *attributes the causes to “the effects of the precession of the equinoxes and proper motions of the stars”*³⁴² after describing them as ecliptic coordinates.
- Since precession of equinoxes is already mentioned as the first cause, he seems to have substituted it with the movement of the celestial North Pole in the 2nd point.
- Without realising what he has written in that chapter (that the location with reference to the ecliptic and the vernal equinox causes the changes in RA and Declination of a star), Niles Oak has *introduced a new concept that the movement of celestial North Pole causes the change in RA and Declination of the stars*. Truly a new discovery!

Did North Pole make peculiar orientation with A-V?

Niles Oak does not describe in his book how the North Pole (NCP) makes a peculiar orientation with A-V but describes something closer to that idea in his videos. He draws the plan view of the precession circle of the earth's axis (seen from above). After drawing the precession circle he arbitrarily places the two stars, Vasishtha and Arundhati next to the circle (Figure 1)

³⁴⁰http://www.astronomy.ohio-state.edu/~pogge/Ast162/Unit1/Images/uma_50K.gif and <http://orbitalimulator.com/gravitySimulatorCloud/stars.html?12,15,25,6,57,1,57,4,1200,-104000,1000,0,100,0,4,5,0,1,0,1,15,0,5,0000ff,0,0,1,1,4,79,1,4,30,0,4,170,0,4,255,0,4,340,0,4,465,0,4,530,0,4,660,0,260,30,0,260,200,14,0,515,30,0,5,ff00b9,1,0,0,-104000>

³⁴¹<http://stars.astro.illinois.edu/sow/mizar.html>

³⁴²“When Did The Mahabharata War Happen?” Page 24

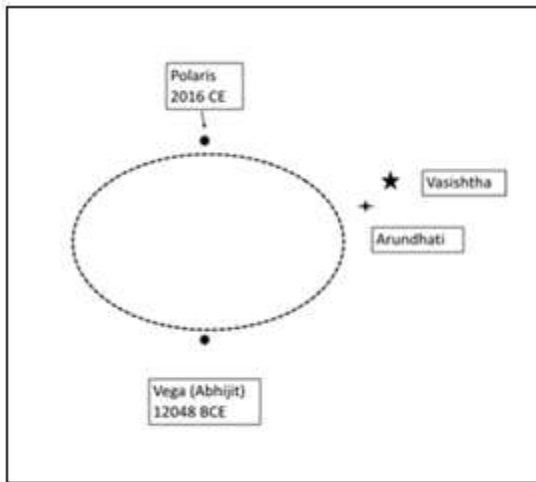


Figure 24: Niles Oak's diagram

Then he joins the two stars and extends the line to the circle. Where it cuts the circle marks the “Epoch of Arundhati”. (Figure 2)

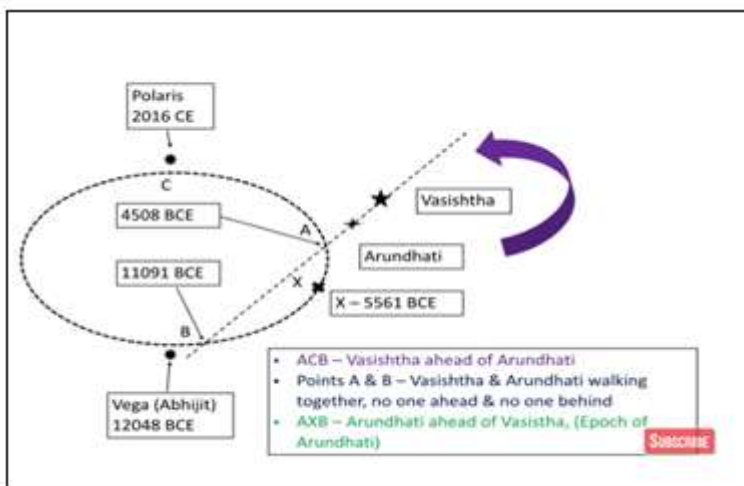


Figure 25: From Niles Oak's video

Every point in the arc AXB marks a NCP of the corresponding period. Throughout the period of AXB, Arundhati had crossed the meridian before Vasishtha. This must have been meant by Vyasa as Arundhati walking ahead of Vasishtha, according to Niles Oak.

He joins the two stars (A-V) with the NCP (North Celestial Pole) of the year 5561 BCE as shown in the following diagram to drive home the point that Arundhati did walk ahead of Vasishtha. Perhaps this is the ‘peculiar orientation’ Niles Oak has been talking about. (Figure 3)

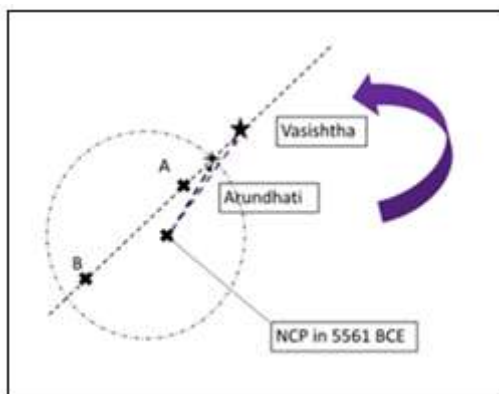


Figure 26: From Nilesh Oak's video

The problem with this postulation is that *this version is valid for a particular time of the day / night from a particular place of observation*. As the earth keeps rotating, the stars also seem to rotate and the A-V stars rotate around the NCP as they are very close to the North Pole. **IN NILESH OAK'S DATE THE TWO WERE IN CIRCUMPOLAR MOTION AND THEREFORE SOON AFTER THEY CROSS THE MERIDIAN THEY START FALLING BACK ALONG THE CIRCUMFERENCE OF THE CIRCLE.** I have marked few positions of the pair in the circumference in the diagram below. I have marked Vasishtha in red. (Figure 4)

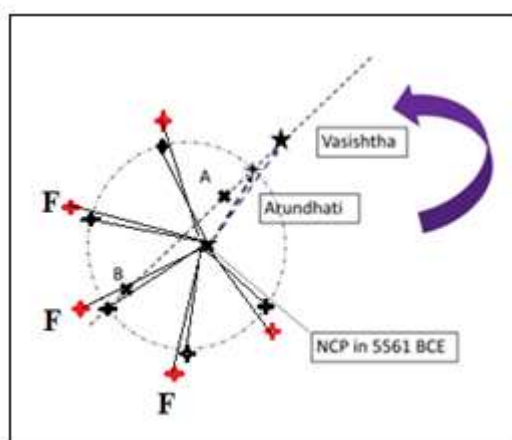


Figure 27: A-V movement around the circumpolar path

As the A-V stars turn around due to the turning around of the earth, Vasishtha starts appearing in front of Arundhati! *The positions marked as F in the above figure shows Vasishtha in front of Arundhati*. What would the observer in 5561 BCE think - Vasishtha in the lead or Arundhati in the lead? And what caused this change? Is this change due to “**peculiar orientation**” of the NCP to the two stars or the circumpolarity of the two stars? Do I need to state the obvious? I can only recall Thomas Kuhn's criticism of Karl Popper, that the ‘researcher’ will be inclined to see what he wants to see and Nilesh Nilkanth Oak presents an

extreme case of how such a researcher loses simple IQ in his craving for a place along with Kepler, Galileo and Copernicus!

Not for 6000 years, but only for 16 hours a day – Arundhati walked in the front!

From Nilesh Oak's diagrams, we can show the fact of Arundhati not walking ahead even for 16 hours a day. One such diagram for his Mahabharata date is shown below from his video.³⁴³ He has shown Arundhati crossing the meridian ahead of Vasishtha at 2-56 AM. One

cannot help asking if Vyasa kept awake till then to see which of the two crossed the meridian.

In his book Nilesh Oak makes a statement that “Vyasa was observing the sky not only after sunset, but also before dawn.”³⁴⁴ HE DOESN'T THINK THAT VYASA REMAINED WAKEFUL

THROUGHOUT THE NIGHT TO OBSERVE THE ASTRONOMY FEATURES. But his date requires Vyasa to be awake at odd hours past midnight.

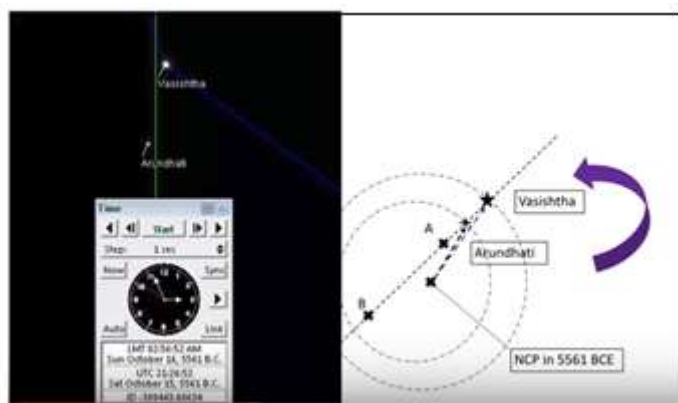


Figure 28: A-V at meridian from Oak's video

In Figure 5, the simulator view of Arundhati crossing the meridian on the night of Nilesh Oak's date of Mahabharata war is shown in left. THE TIME OF CROSSING, SHOWN IN THE SIMULATOR CLIP IS 2-56 AM. The same is shown by him in the diagram at the right in plan view. We can trace the movement of A-V in the same figure in other positions around the NCP as shown in Figure 6.

³⁴³ <https://www.youtube.com/watch?v=RedV48OCEfg>

³⁴⁴ "When Did The Mahabharata War Happen?" Page 85

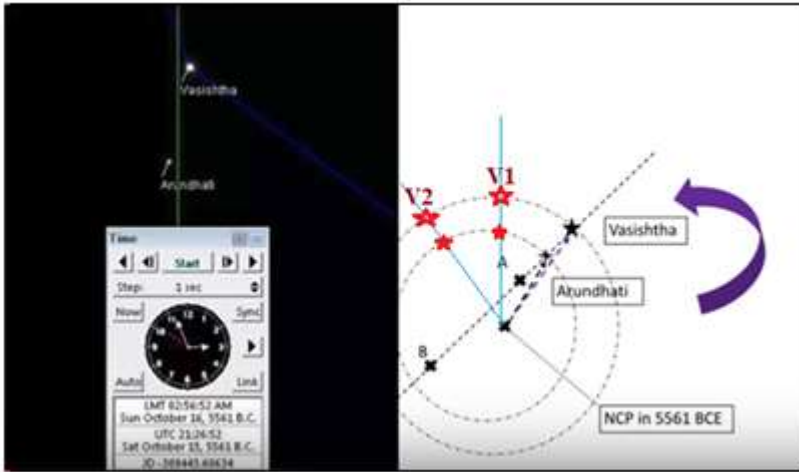


Figure 29: A-V movement after crossing the meridian

At V1 the two stars are seen one behind the other, but the observer facing the meridian will see Vasishtha ahead of Arundhati at V1. At V2 Vasishtha is clearly ahead of Arundhati! This is happening within few hours. To know how soon the change has happened in Nilesch Oak's date of Mahabharata war; let me rotate the figure given by Nilesch Oak to the left by 90° . In 90° degrees, six hours are crossed and the time will be 8-56 AM. The midpoint of that is 5-56 AM at pre-dawn when Vyasa was awake to do morning oblations (Figure 7)

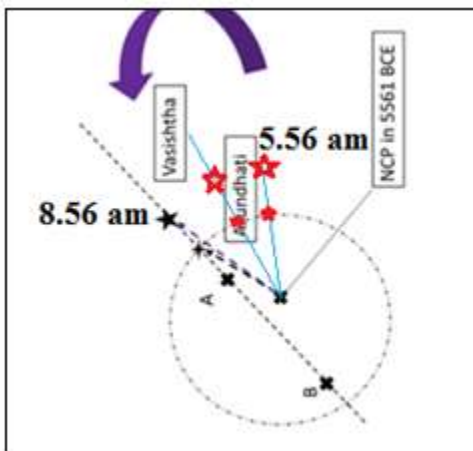


Figure 30: A-V movement at pre-dawn in Oak's date

The figure shows that at 5-56 AM Vasishtha is at the verge of crossing Arundhati. At 7-26 AM it is leading. At 8-56 AM Vasishtha is clearly on the lead. The same kind of rotation goes on all days throughout the year and Vyasa must have seen Vasishtha ahead of Arundhati in his morning times, before sun rise in the previous months.

From Nilesch Oak's plan view let us shift to terrestrial view (Figure 8). Who is in the lead after Arundhati crosses the meridian?

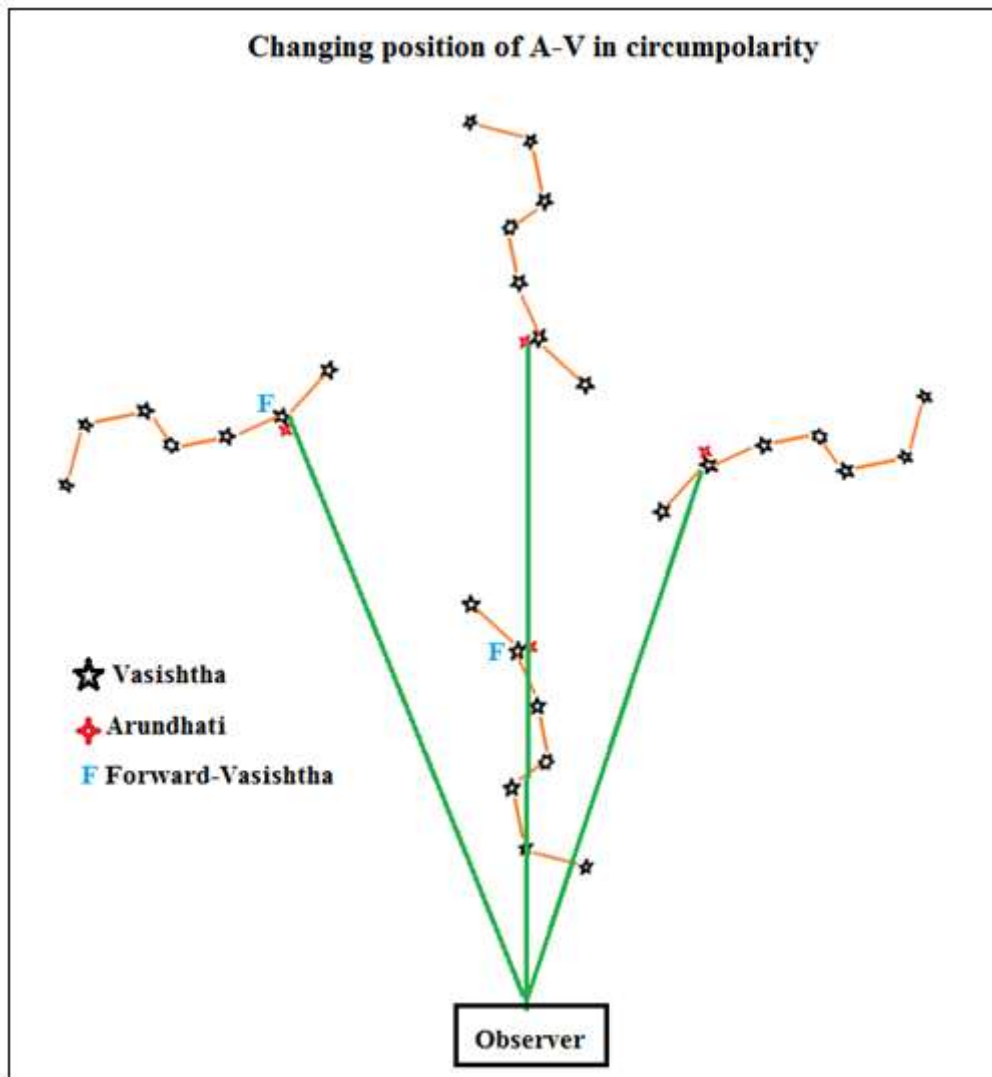


Figure 31: Changing position of Arundhati and Vasishtha in 24 hours

The figure shows Sapta Rishi Mandala with Arundhati having lower RA than Vasishtha so that Arundhati can cross the meridian before Vasishtha. This position of Arundhati (red star) is not as it appears now. I have positioned it as it appears in Nilesch Oak's video. The central green line is the meridian. I am showing here the four positions separated by 90° , i.e. 6 hours. As the constellation turns round, the angle flips, making Vasishtha appear in front of Arundhati.

What would the observer say?

Vasishtha going ahead of Arundhati or Arundhati going ahead of Vasishtha?

The only answer is- IT ALL DEPENDS ON THE TIME OF OBSERVATION. *If Arundhati seems to lead for a few hours, Vasishtha will be seen in the lead in the next few hours of the same night.*

Can anyone one, in the right sense of mind, make a statement that Arundhati went ahead of Vasishtha by looking at the stars at one particular time of the night?

Particularly someone like Vyasa who is an expert in the science of astronomy, would have seen the star-pair in different positions in different months. Having seen the pair appear differently at different times in the same night and in different months for the same time, can he be expected to make a statement that Arundhati went ahead of Vasishtha?

NILESH OAK HAS MADE A BASIC ERROR OF OVERLOOKING THE FACT OF CIRCUM POLAR ROTATION OF THESE TWO STARS

When he drew the **plan view**, he failed to check the overall path of the two stars. He has just focussed on one part of the movement and claimed that Arundhati went ahead. In the following figure taken out from his video, I have drawn the paths of the A-V stars around the NCP (Figure 9).

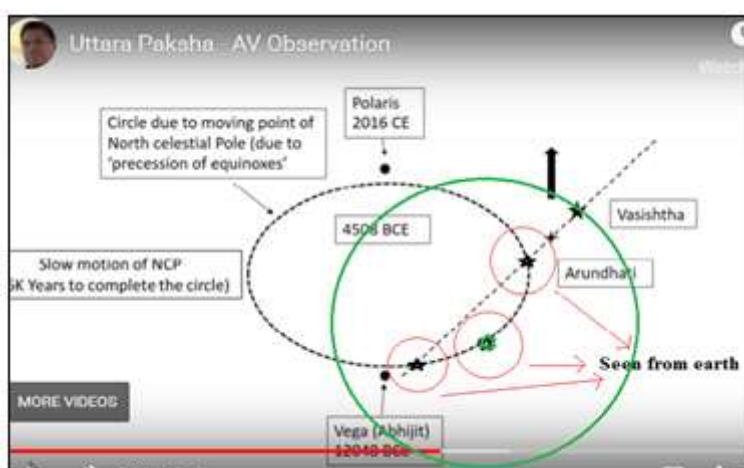


Figure 32: A-V with different NCP.

Every point in the dotted circle is a Pole star and every pole star is being circled by the A-V pair. Right from the lower limit of the “Epoch”, i.e. 4508 BCE until c.7500 BCE, the two stars were in circumpolar motion. The red circles in the above diagram are the circumpolar circles of these two stars for different pole stars (illustrative purpose). *The point of the NCP is seen by an observer from the ground who can also watch the movement of the A-V stars around the pole star.* Nilesh Oak just stopped at the meridian, but failed to see the movement beyond that. By this he has proved that he is only a simulator-centric researcher and not a visual observer of the A-V pair.

A regular visual observer must have seen the pair in different parts of the sky in different months and would have been aware of the various appearances they throw up. Words like

meridian and zenith are jargons in theory, and a regular visual observer would not look at these imaginary lines but at factual appearance of the stars and other celestial bodies. A regular visual observer making a plan view can never fail to plot those appearances too. Let me show what Nilesch Oak has failed to see (Figure 10)

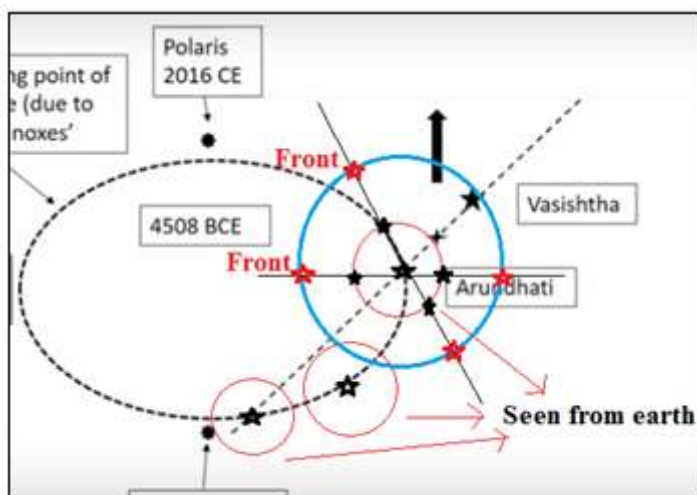


Figure 33: Vasishtha going ahead of Arundhati in the Epoch

The previous figure is re-done with the A-V stars in different positions in their path around the NCP of the “Epoch” period. I have picked out one circle and shown the movement of the two stars around the pole (Arundhati in red circle and Vasishtha in blue circle). Vasishtha is ahead of Arundhati for considerable part of the circle (in blue). The reason is simple.

ARUNDHATI IS ALWAYS IN THE INNER CIRCLE WHILE VASISHTHA IS ALWAYS IN THE OUTER CIRCLE. Their path is like two concentric circles one inside the other where the inner circle is always travelled by Arundhati.

A test for this in ‘*Simulator Nyaya*’ is to check the dates of entry and exit of Arundhati and Vasishtha from circumpolarity. Arundhati had entered the circumpolar motion many years ahead of Vasishtha in c.7500 BCE. While exiting, *Vasishtha had exited first, years before Arundhati in c.800 CE. This can happen only if Arundhati is in inner concentric circle with Vasishtha positioned outside.*

In Figure 34, imagine the A-V pair wheeling inside the circumpolar circle. While entering Arundhati enters first. When they are wheeling out, Vasishtha exits first.

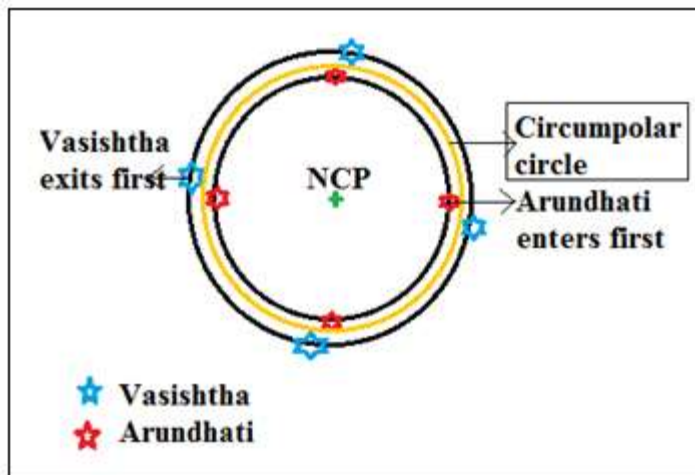


Figure 34: Entry and exit of A-V stars in circumpolarity

As I already revealed in the 8th chapter on Prishṭha, Arundhati has always been at the lower or back part of Vasishtha. Nilesh Oak can be seen drawing the two circles, Arundhati in inner and Vasishtha in outer while explaining the walking ‘ahead’ of Arundhati in one of his videos (Figure 12).³⁴⁵

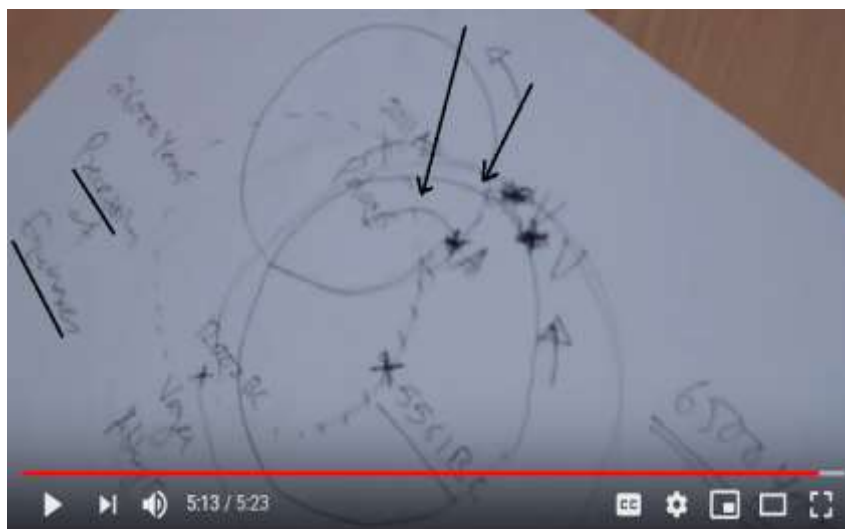


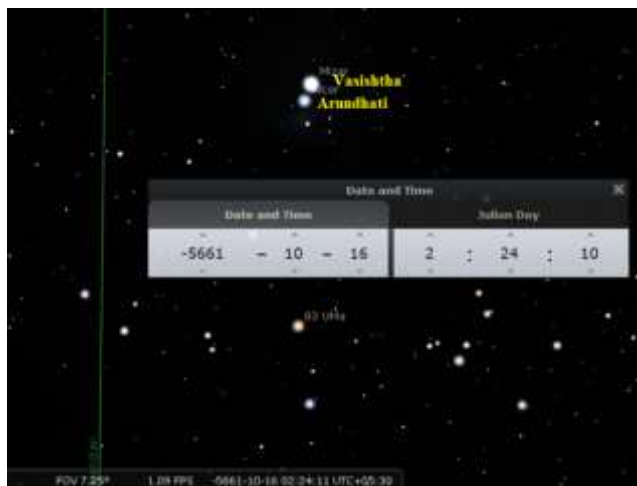
Figure 35: From Nilesh Oak's video

Figure 35 is picked out from Nilesh Oak's video. The arrow marks are drawn by me to show that Arundhati (A) is in inner circle while Vasishtha (V) is in outer circle. Nilesh Oak got stuck at the point of Arundhati crossing the meridian and had remained oblivious of the fact that the movement proceeds further with the outer Vasishtha seen ahead of Arundhati to the observer on ground.

³⁴⁵ <https://www.youtube.com/watch?v=icMT9e617YY>

Simulator-Nyaya shows Arundhati lagging behind.

An excited Nilesch Oak, excited at having made an ‘Epoch’ making discovery encourages the readers “*to run their own simulation to validate*” his findings.³⁴⁶ I ran the Stellarium simulator and found validation for what I have been saying above! In the early morning hours of Nilesch Oak’s first day of Mahabharata war, Arundhati did appear ahead of Vasishtha (clipping below). One can check the stars against the meridian given as a green line. The simulation is for Hastinapur from where Vyasa made the observation. The time was 2-24 AM.



The movement across the meridian is shown from Stellarium in the next illustration along with Nilesch Oak’s simulation on the left.



³⁴⁶ “When Did The Mahabharata War Happen?” Page 69

The Stellarium figure in the right shows **the circumpolar circle in blue colour** to get an idea of how the A-V stars moved close to the pole star compared to the entire Sapta Rishi Mandala in Oak's date. This is to convey that the A-V stars remained very well inside the circle and therefore in circular motion.

Nilesh Oak's simulation in the left is enlarged many times, and the observer doesn't see the two stars in the way he shows, but only as how it is seen in the right side figure. From Nilesh Oak's simulation it is known that Vasishtha crossed the meridian 30 seconds after Arundhati.

The Stellarium illustration gives the visual appearance of the two stars in the entire constellation and it is possible to gauge HOW DIFFICULT IT IS FOR THE HUMAN EYE TO CAPTURE THE MOVEMENT WITHIN 30 SECONDS. The two stars will be seen as a single source of light for an observer on the ground. The two stars are very close as though Arundhati was chasing away Vasishtha and Vasishtha moving upwards, away from the NCP. The observer may even think that *Arundhati is 'angry' with Vasishtha* by encroaching him to pick up a fight with him. Such a description is given by none other than Hanuman to Sita in the meeting at Ashoka Vana.³⁴⁷

कोपात् वायदि वा मोहात् भर्तारम् असित ईक्षणा || ५-३३-८

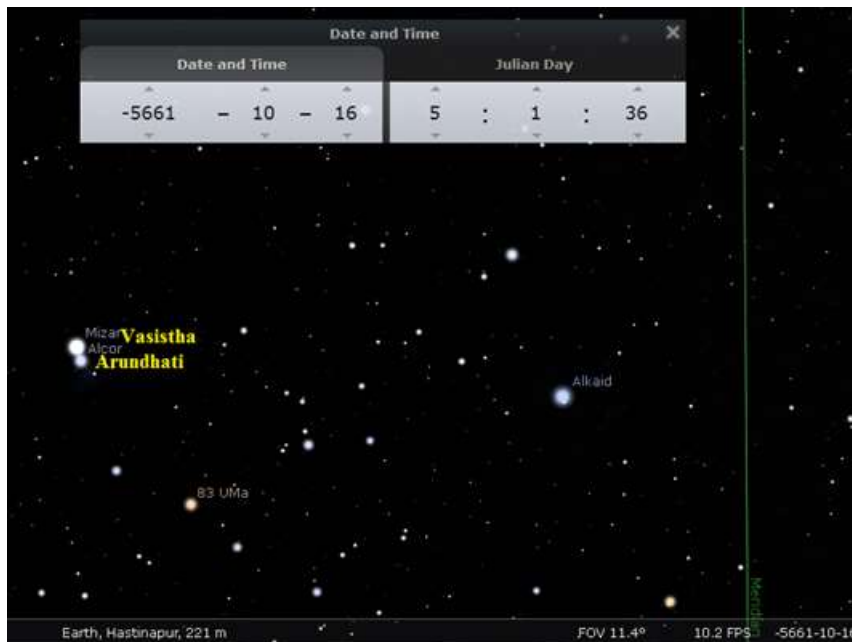
वसिष्ठम्कोपयित्वा त्वम् न असि कल्याणि अरुन्धती |

"O dark-eyed lady! Are you not the auspicious Arundhati, who irritated her husband, Vasishtha the sage either by anger or by error?"

The positional alignment indicated by the above verse happening in the 5561 BCE looks more suitable **to date Ramayana in 6th millennium BCE as Pushkar Bhatnagar had done!**

The entire Sapta Rishi constellation is on the ascending mode, somewhat vertical, in contrast to how it normally looks as an inverted ladle above (south of) the NCP. Keeping a discussion on that later, we will continue to see how the alignment of the A-V stars changes after crossing the meridian. They start appearing differently within two and a half hours on the same night of Nilesh Oak's date. The following simulation from Stellarium shows Vasishtha ahead of Arundhati less than 3 hours after they crossed the meridian.

³⁴⁷Valmiki Ramayana: 3-13-8



The above simulation is for 5 AM when Vyasa must have been outside, perhaps taking bath or doing oblations. He must have definitely seen the Sapta Rishi Mandala and the A–V stars as shown in the simulator. Can he be expected to say that Arundhati put her husband in her Prishṭha on seeing the pair in the above alignment?

Let me reproduce the positional alignment of A–V stars within 2- hour duration in Nilesch Oak's first day of Mahabharata war.

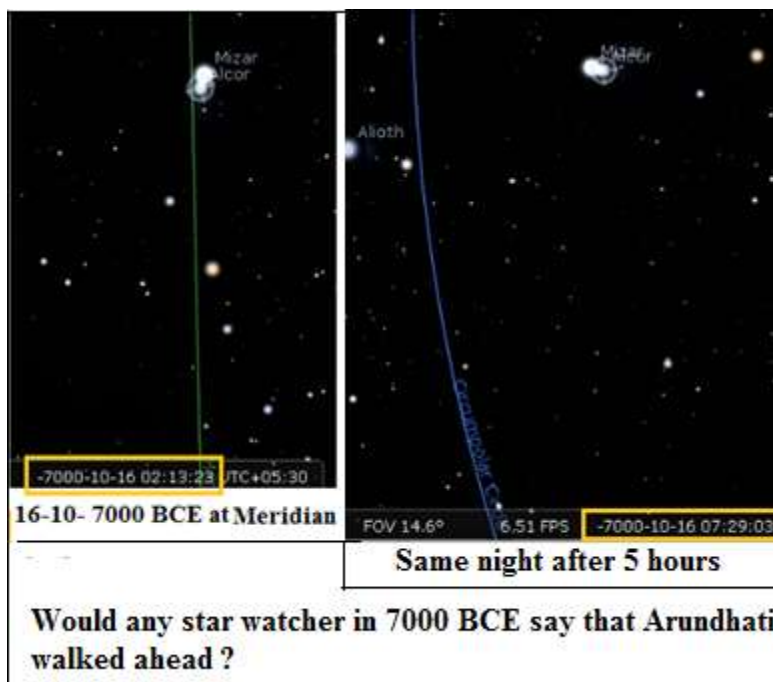
At the time of crossing the Meridian





The angle of A-V alignment changes **within 2 hours** in
Nilesh Oak's date of Mahabharata war

The above figures show the difference in the appearance of A-V stars within two hours, from 2-33 AM to 4-20 AM on the early hours of the first day of Nilesh Oak's Mahabharata war. This kind of change in the appearance of the alignment can be seen on any day in the said period of the "Epoch of Arundhati". Let me show the change for the year 7000 BCE, courtesy Stellarium simulation.



This phenomenon of changing appearance of the alignment is illustrated by means changing appearance of objects in a curved path in Figure 13.

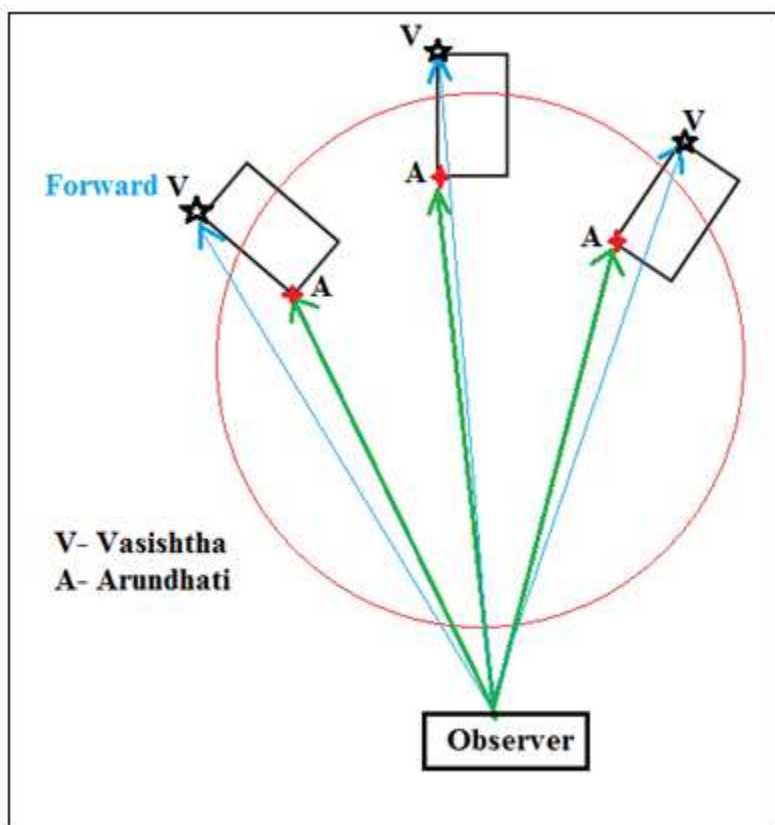


Figure 36: Sample illustration of changing appearance in circumpolar motion

The two edges marked as V and A correspond to Vasishtha and Arundhati. As the object keeps moving in an arc, Arundhati appears first with Vasishtha lagging behind. THE OBSERVER CANNOT EVEN IN HIS DREAM CLAIM THAT ARUNDHATI (A) WENT AHEAD OF VASISHTHA (V) BECAUSE HE AS A VISUAL OBSERVER WOULD START SEEING VASISHTHA AHEAD OF ARUNDHATI ONCE THE OBJECT TURNS IN THE ARC. He must have been aware of the changed alignment hours ago or hours after or at the same hour in a different month.

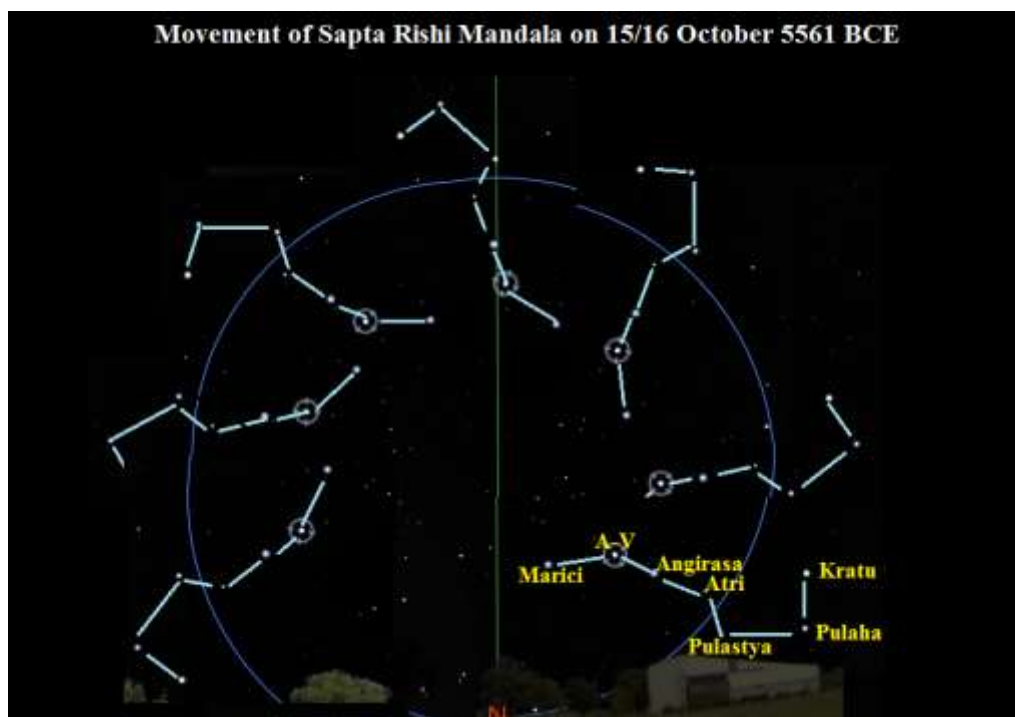
Right Ascension, not always a proof for movement ahead.

The main drawback in the research of Niles Oak is that he doesn't seem to have a clear grasp of what he expects to see for Arundhati walking ahead of Vasishtha or what could actually be the concept that could have made Arundhati seeming to walk ahead of Vasishtha. In all the 5 experiments he had done (Ex 7 to be excluded as it is not an experiment at all), he was found shooting on all sides, checking with all probable terminologies related to a star without knowing if they could actually produce a scenario of Arundhati ahead of Vasishtha. All that **he was looking for is a reversal from the current position**, with the result he landed up at RA value at a declination where it means something else.

Generally *RA is used to locate a celestial object in the sky*. But it CANNOT GIVE A WHOLESOME PICTURE WITHOUT THE DECLINATION DEGREE OF THE OBJECT. The RA is a projection of earth's longitude and declination is the projection of the latitude. Just as how a location on earth can be identified only by a combination of both latitude and longitude, the location of a star can be identified only by means of the two co-ordinates, viz. RA and declination.

Picking out RA alone cannot give the true picture of the star's position and also the path. The path comes into the picture when declination falls within the radius around the NCP that is less than the degree of the latitude of the observer, in which case the star will be in circumpolar path and not a linear path from one horizon to another. The concept that a star with lesser RA will cross the meridian first compared to the star with a higher RA holds good when the star under comparison rises from the horizon and sets in the horizon. IN CIRCUMPOLAR REGION, THERE IS NO RISE AND NO SET AND THEREFORE THERE IS NO QUESTION OF WHO ROSE FIRST OR WHO SET FIRST. The stars in circumpolarity will cross the meridian not once, but twice within 24 hours which is not so with the stars that rise and set from horizon to horizon.

Oblivious of these facts, Nilesh Nilkanth Oak has proposed the idea that Arundhati with lesser RA 'walked ahead' of Vasishtha having a slightly higher RA while in reality the two flipped their positions forward and backward within hours in the same day, as explained through illustrations earlier. In such a scenario of circumpolarity, the RA and declination of a star is used only to know their position in the sky and not who crosses the meridian first.



{The movement is like a tennis player serving the ball with the racquet held in such a way that A (Arundhati) is the wrist and V (Vasishtha) is the fist. The position at meridian looks like the top service of the ball when the wrist is slightly forward with the fist turning on top of it. After that the hand moves forward forming an arc, in which position the fist would always be forward with the wrist behind it.}

The above figure incorporates different positions of the Sapta Rishi Mandala within 24 hours on the 1st day of Mahabharata war in Nilesch Oak's timeline. What would a visual observer make out from this?

- Would he say that Marici went ahead of the rest of the 6 Rishis + Arundhati at the time of rising? Would he say that Kratu crossed the meridian first, following Nilesch Oak's logic?
- If Kratu had crossed the meridian first, would he say that he was ahead of all the others till the time of setting? (The first three stars were not in circumpolar, they were rising and setting)
- Pulaha crossed the meridian after Kratu but is seen forward of Kratu at the time of setting. How would the observer note this – that Pulaha went behind or ahead of Kratu?
- Look at A-V as part of the entire constellation. Can an observer at any time say that one of them (A or V) went ahead of the other at the meridian? He can't say for he would be seeing the constellation as whole that keeps changing positions, and it is irrelevant to view one as ahead of or behind the other.

If, in spite of this, Vyasa had observed Arundhati ahead of Vasishtha, then the cause must be something else and not RA difference!

In Nilesch Oak's Mahabharata date the RA factor was irrelevant for Arundhati and Vasishtha in circumpolar motion.

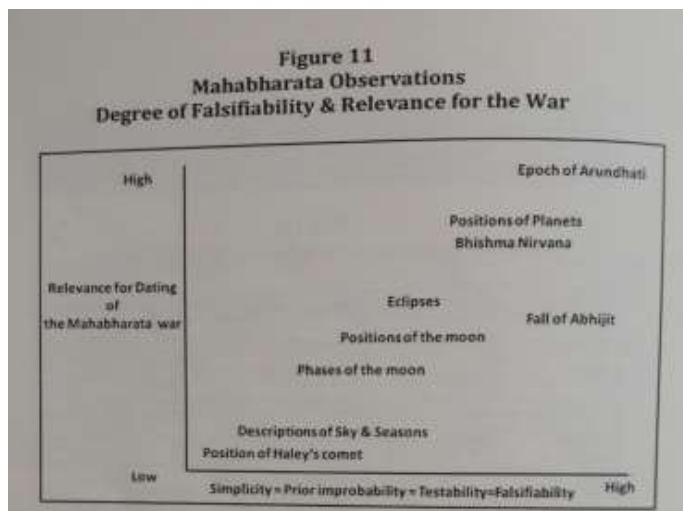
There was no-ahead and no-behind position for them in circumpolarity.

His theory of "Epoch of Arundhati" is non-existent.

Therefore

Nilesch Oak's Mahabharata date is non-viable.

In his book, Nilesh Nilkanth Oak has laid the highest relevance and falsifiability for the A-V observation. He has plotted it in Figure 11 in his book (Below)



Claiming his theory of Epoch as a better theory, Nilesh Oak adjudged the highest degree of falsifiability to the so-called Epoch of Arundhati walking ahead of Vasishtha. He wrote,³⁴⁸

"I was not looking for statistical significance but rather the significance of a given Mahabharata observation for either predicting or eliminating, certain time intervals for the plausible year of Mahabharata War. I did this by running a thought experiment where all other observations are removed except a specific observation, and then assessed the change in predictions and quality of predictions due to the testing of such lone observation."

According to him the single observation of Arundhati ahead of Vasishtha had set a time period which remained unaffected when all the other Mahabharata observations were eliminated. In his words,³⁴⁹

"Ability of Arundhati observation to predict the time interval for the plausible year of Mahabharata War is not affected, when all other Mahabharata observations are eliminated."

Now the idea of Arundhati's walk-ahead is proven wrong and non-existent due to circumpolar movement of Arundhati and Vasishtha, the highest degree of falsifiability and relevance of the so-called Epoch lies shattered. **THE YEAR OF MAHABHARATA WAR DEDUCED FROM THIS NON-EXISTENT EPOCH ALSO BECOMES REDUNDANT.** Nilesh Oak's claim that the "observation of Arundhati falsifies all but 4 proposals for the year of Mahabharata war..³⁵⁰ also stands invalid. His rationale of keeping the date of Ramayana before the start of

³⁴⁸ "When Did The Mahabharata War Happen?" page 201

³⁴⁹ Ibid. Page 201

³⁵⁰ Ibid, Page 203

the so-called Epoch also stands irrelevant. The illusory image he created by comparing himself with Newton, Kepler and others stands busted.

Right Ascension not a valid test in non-circumpolarity too.

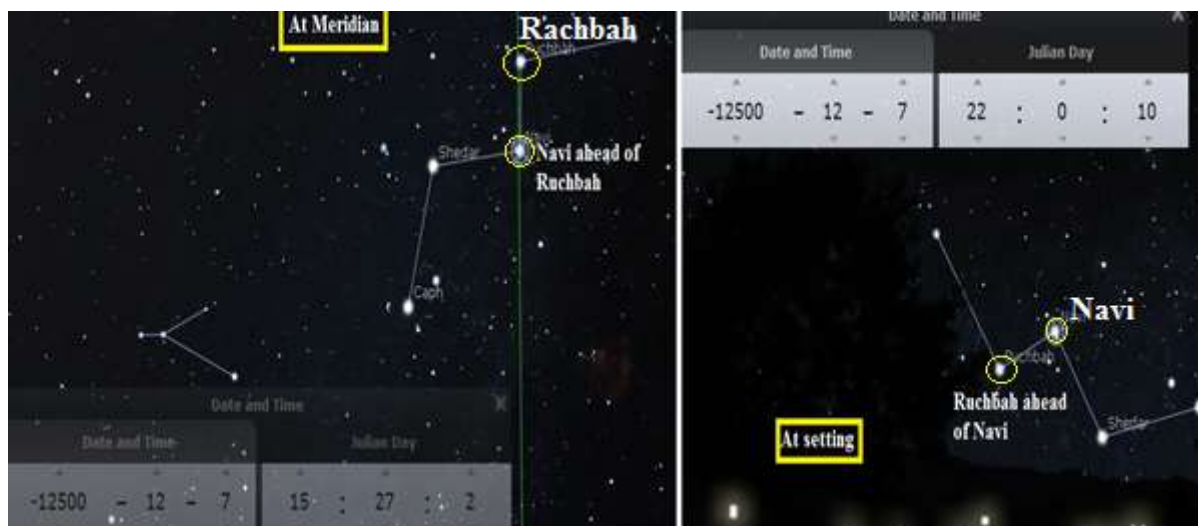
Nilesh Oak's Epoch of Arundhati covers two periods – of circumpolarity and of non-circumpolarity. From c.7500 BCE to 4508 BCE, Arundhati and Vasishtha were in circumpolar motion. Nilesh Oak positioned Mahabharata in this period. Due to circumpolarity his date becomes absolutely irrelevant.

From 11091BCE to c.7500 BCE of the said Epoch, the two stars were crossing sky from east to west. The question comes *whether Arundhati was going ahead of Vasishtha in that part of the Epoch*. For Nilesh Oak, the RA is a deciding factor for forward motion. Let me show that it is not so.

Cassiopeia for comparison.

RA difference cannot decide whether a star is ahead of the other in non-circumpolar positions too. To prove this let me show two scenarios of a pair from Cassiopeia constellation that used to shuttle between circumpolarity and non-circumpolarity. Let me first show them in non-circumpolarity, crossing the sky from horizon to horizon.

Cassiopeia is a W or M shaped constellation that lies on the other side of Sapta Rishi Mandala when they are in circum polar motion. The middle two stars are **Navi** and **Rachbah** at considerable distance from each other and not part of a binary. I chose these two to show that though they are not close like Arundhati and Vasishtha, they share almost same rising time indicated by a meagre difference in RA and cross the meridian one behind the other, with Navi in the lead for most time in the last thousands of years. In the year 12,500 BCE a slight deviation happened. *Though Navi crossed the meridian first, immediately followed by Ruchbah (Navi walked ahead, to use Nilesh Oak's language), it did not maintain the forward march*. As the constellation was nearing the setting horizon, Rachbah came in the lead. The following figure combines the two positions, at meridian and at setting horizon to show that Navi with smaller RA cannot be perceived as a forward moving star.



The entire constellation crossed the sky near prime vertical from east to west. The constellation tilted by more than 90 degrees as it descended on the west. The result was what was behind had become forward moving star. Though Navi with smaller RA crossed the meridian ahead of Rachbah, it did not move forward subsequently to cross the horizon first.

The same constellation when viewed on the day of Mahabharata war of Nilesch Oak's date does not show any change in the leading star. (Figure below)



Navi crossed the meridian first and continued to be in the lead in the descent position towards the western horizon.

In both the examples, the RA of Navi was lesser than that of Rachbah, but Rachbah went on the lead in one while Navi retained its lead in the other.

The common feature for 'ahead' position is setting time and not the crossing at the meridian.

It is universally held that the leading one would set first. For example the Sun is said to be in the lead of other planets when it sets first followed by other planets. The setting time is therefore a better concept than lesser RA crossing the meridian.

The **setting time** is a

FALSIFIER

for the concept that Right Ascension time decides who goes forward

Setting time decides the final forward position

The RA and declination of a star decide the location of a star in the sky. Whether it is ahead of a close companion depends on the path of rotation. As the earth turns round, the path of the stars also gets altered. A star may be ahead of the other in one part of the arc of the path, and it may change in a subsequent part. **THE FINAL OUTCOME IS DECIDED BY WHO DISAPPEARS IN THE WESTERN HORIZON FIRST.** So the setting time of Arundhati and Vasishtha can decide who ultimately moved forward.

Earlier I debunked the RA based Epoch of Arundhati for the Mahabharata year of Nilesch Oak when the A-V stars were in circumpolar motion. In circumpolarity, it is absurd to say that one of them walked ahead of the other. This started from the commencement of circumpolarity at c.7500 BCE in Nilesch Oak's Epoch. Before that, starting from 11091 BCE, Arundhati with lower RA and Vasishtha were in non-circumpolar motion. This period must be checked to establish who among the two had moved forward. **The two stars were moving from horizon to horizon** and therefore could be expected to retain the positional alignment as did Navi and Rachbah of Cassiopeia constellation in Nilesch Oak's Mahabharata date.

To resolve this accurately I approached **Dr Harish Saranathan**,³⁵¹ holding PhD degree in Aerospace, Aeronautical and Astronautical Engineering from Purdue University and working on aerospace and radar applications in Signal processing and communication, gave him Nilesch Oak's book to read the chapter on the Epoch of Arundhati and explained my stance expressed above. He agreed to resolve this mathematically by deriving the rise and set times of Arundhati and Vasishtha for the entire Epoch of Arundhati. Worth recalling here is Albert Einstein's words,

³⁵¹ <https://www.linkedin.com/in/harish-saranathan-ph-d-b6684785/>

“One reason why mathematics enjoys special esteem, above all other sciences, is that its laws are absolutely certain and indisputable, while those of other sciences are to some extent debatable and in constant danger of being overthrown by newly discovered facts.”

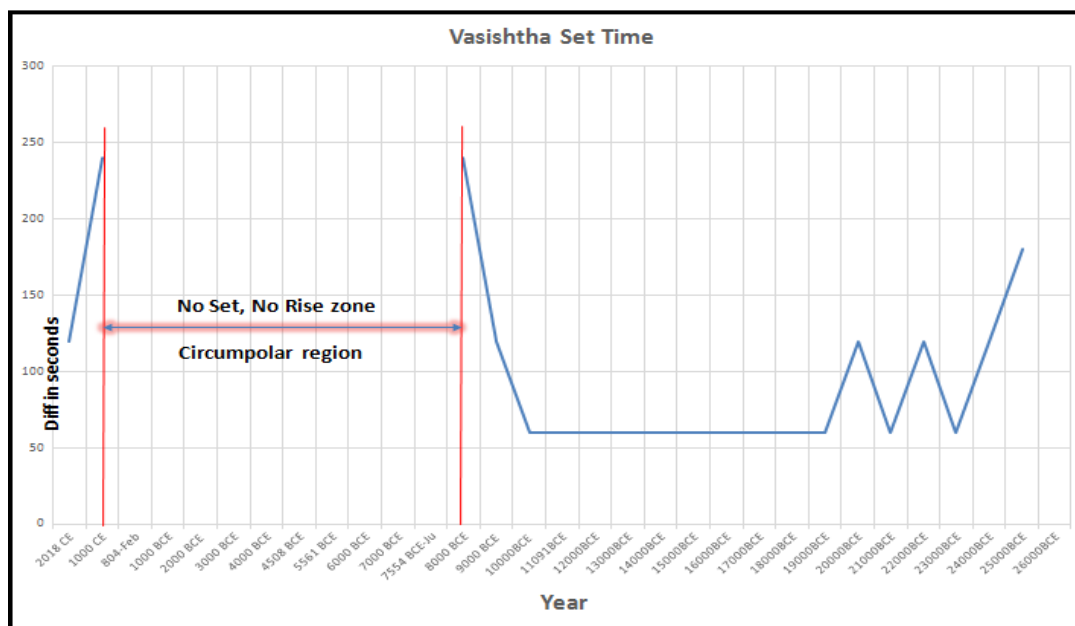
He explained to me why **RA cannot be picked out without declination** and his views were incorporated above in my explanation on why RA is not always a valid proof for forward movement. His explanation, derivation and calculation for how the coordinates change with the observer's local horizon is reproduced in **Appendix II**. A sample derivation of the rise- set times for the year 9000 BCE for Hastinapur is given by him in that section. He checked for all the years having **negative RAD** given in Table 4 in Nilesh Oak's book and did for the left out years 9000 BCE and 10,000 BCE also. His calculations show that Vasishtha set first despite having slightly higher RA than Arundhati throughout the non-circumpolar period of the so-called Epoch of Arundhati. His results are tabulated below.

Date	Rising first	Setting first
4509BCE	NA	NA
5000BCE	NA	NA
5561BCE	NA	NA
5700BCE	NA	NA
5800BCE	NA	NA
5900BCE	NA	NA
6000BCE	NA	NA
6250BCE	NA	NA
6500BCE	NA	NA
9000BCE	Alcor	Mizar
10000BCE	Alcor	Mizar
11088BCE	Alcor	Mizar

(Alcor = Arundhati, Mizar = Vasishtha, NA = Not Available, to mean no rise, no set)

Figure 37: Arundhati – Vasishtha rise- set table

The difference in the rise- set times of Arundhati and Vasishtha is depicted graphically. The first graph describes the setting time of Vasishtha. *I deducted the setting time of Arundhati from the setting time of Vasishtha and plotted the result as a graph*. Positive value means Vasishtha has set ahead of Arundhati. The line is found positive throughout the period starting from 26,000 BCE for which data was collected from Stellarium software.

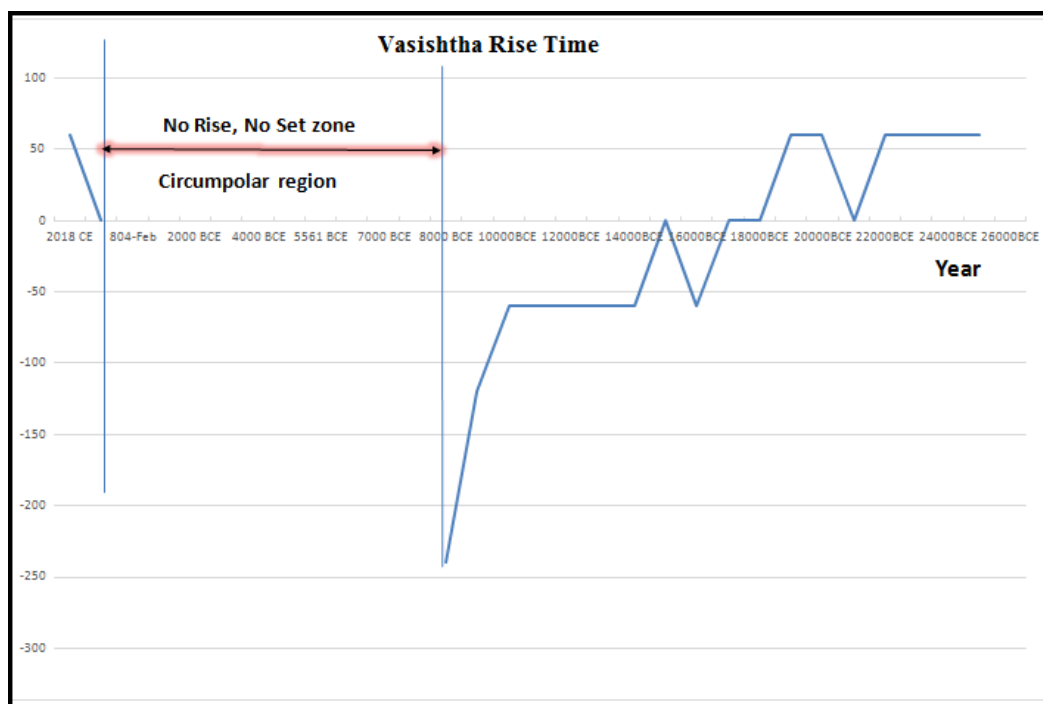


(Set Time Vasishtha – Set Time Arundhati = Positive number)

Throughout the years from 26,000 BCE to 2018 CE Vasishtha was setting ahead of Arundhati.

This implies that by the time they finish their journey in the sky Vasishtha was ahead of Arundhati on all the days of 28,000 years. Did Arundhati overtake him in this unaltered journey path? Never. **TRUE TO HER NAME ARUNDHATI HAD NEVER CROSSED THE PATH OF VASISHTHA IN THE SKY!**

Looking at the rise- timings, the same method of deducting the rising time of Arundhati from the rising time of Vasishtha was used. The line chart is not uniformly positive like the set-time graph. It was positive until c.17,500 BCE but negative thereafter. This means Vasishtha was rising earlier than Arundhati till c.17, 500 BCE. After that Arundhati started rising early until the two entered circumpolarity. **AFTER EXITING CIRCUMPOLARITY, VASISHTHA STARTED RISING EARLIER THAN ARUNDHATI TILL DATE.** For comparison with the set-time graph, Vasishtha rise-time graph is given below.



(Rise Time Vasishtha – Rise Time Arundhati = Positive number till 17000 BCE, Negative number after that until the pair entered circumpolarity)

A pattern emerges that Arundhati had been rising early since 17,000 BCE and sets late after Vasishtha for all the time since 26000 BCE. **THIS IS IN TUNE WITH THE PERSONIFICATION OF A PATI-VRATĀ AS ONE WHO RISES BEFORE HER HUSBAND AND GOES TO SLEEP AFTER HER HUSBAND SLEEPS.** A society that has been watching the two moving like an ideal couple had immortalised the name of Vasishtha and Arundhati by giving their names to these two stars.

The conceptualisation of Arundhati, the *pati-vratā* rising earlier than her husband could have started any time after 17,000 BCE, but not before. This sets a limit for Vedic past as not having gone before 17,000 BCE.³⁵²

More importantly the set-time data of A-V stars refutes Nilesh Oak's theory that Arundhati went ahead of Vasishtha for all times in the 6000 + period of the so-called Epoch of Arundhati.

The ever continuing pattern of Vasishtha setting earlier than Arundhati falsifies Nilesh Oak's RA based theory of Arundhati walking ahead of Vasishtha.

³⁵² This is as per the current western astronomy software, which I claim to be redundant for dating the Indic past. As per Siddhantic precession, the star Arundhati had never risen after or set before Vasishtha anytime in the past. Since Nilesh Oak is showing his version from the modern software, I am also showing from the same to establish that he is wrong.

Right Ascension can only indicate which star crosses the meridian first but not validate whether the same star continues to be ahead until it disappears in the western horizon.

There is no evidence to prove that Vyasa referred to the crossing at the meridian. In fact Vyasa had referred to the rising Saptarishi Mandala³⁵³ in the same narration of nimittas which could only mean that it was lower down, near the northern horizon and was about to climb in anti-clock direction. This makes the A-V observation happening at lower horizon and not at zenith.

Crossing the meridian at zenith takes 12 hours for A-V stars in circumpolar motion, if the two stars were observed near the horizon initially. **IN NILESH OAK'S DATE THIS CROSSING OCCURRED WELL PAST MID NIGHT, REQUIRING VYASA TO HAVE KEPT AWAKE TO SEE IT TO REPORT IT;** in traditional date of Mahabharata, it occurred around sun-rise or after sunrise.

The idea of circumpolar stars such as A-V stars crossing the meridian is vague unless specifically told in the text whether north or south of the NCP, the reason being they cross the meridian twice within 24 hours.

The so-called Epoch of Arundhati now proven to be irrelevant in the Mahabharata context, the only positive outcome of watching the journey of this couple for thousands of years through the simulated view of the entire Sapta Rishi Mandala is such that the various appearances of the two stars in different time-periods match with various descriptions about the sage-couple in Mahabharata.

Episodes of Arundhati matching with the A-V stars through the millennia.

1. Arundhati stayed back when Sapta Rishis went away.

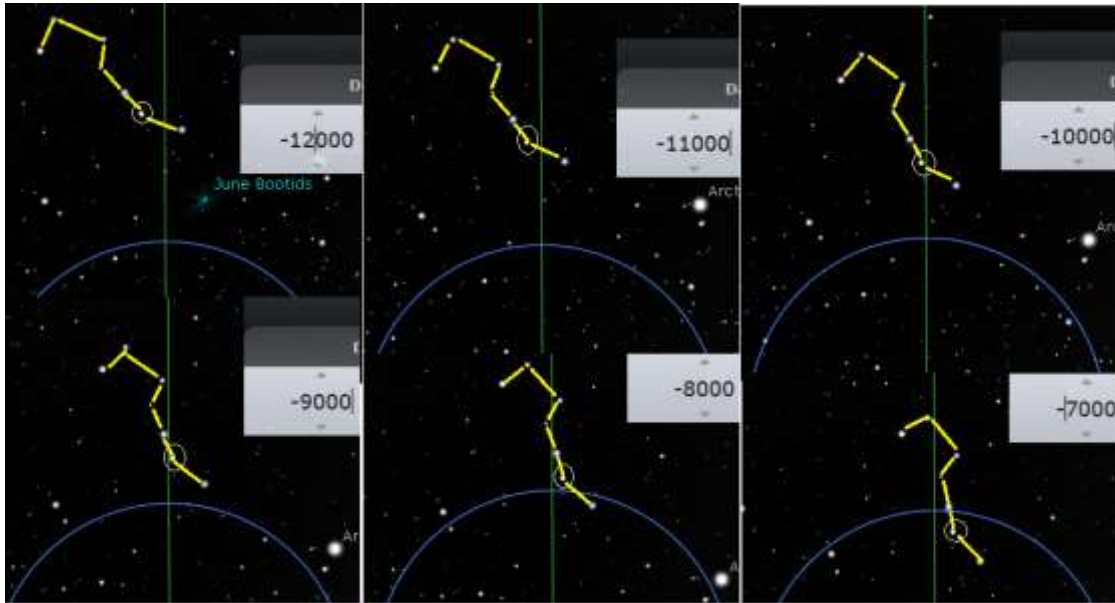
One of the stories of Arundhati recounted in Mahabharata is about Arundhati staying back when the other Rishis had gone for penance.³⁵⁴ It took 12 years for them to come back. 12 years in divine years is equal to 4320 years in solar years (12 x 360). The position of the Sapta Rishis from c.12, 000 BCE to 7500 BCE (when A-V entered circumpolarity) was high above the North Pole in upright position. The appearance of Arundhati remaining close to the circumpolar circle with the other stars away started from c.8000 BCE. People watching for generations from long past could be imagining that the sages who had left away are slowly

³⁵³ Mahabharata: 6-3-24 <http://www.sacred-texts.com/hin/mbs/mbs06003.htm>

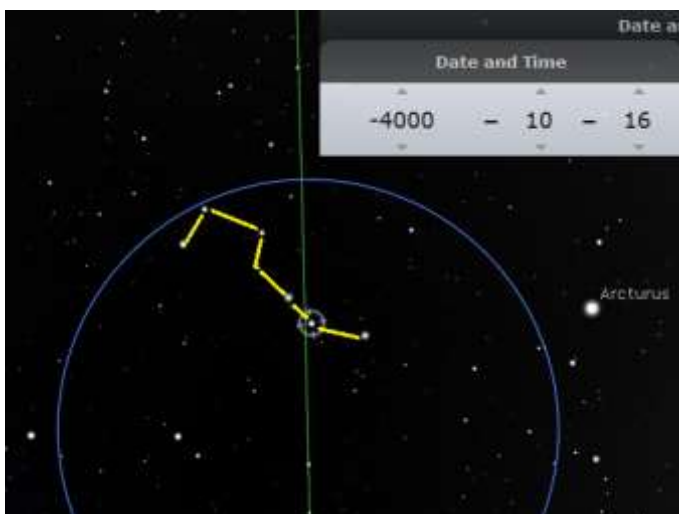
³⁵⁴ Mahabharata: 9-47 <http://www.sacred-texts.com/hin/mbs/mbs09047.htm>

returning while Arundhati had stayed closer home. Similar event in Arundhati's life finds a parallel in the way the constellation had appeared over a period.

The simulations from 12000 BCE to 7000 BCE shows this legend must have started before 8000 BCE but keenly observed after wards when Arundhati was close to circumpolarity. The following figure given in two rows of three each shows in sequence the chaste Arundhati staying back if such an observation was made just before or around 8000 BCE.



12 years later, i.e. 4320 years later, all of them must have been back home. From 8000 BCE this comes to around 4000 BCE. The position of the Sapta Rishis at 4000 BCE exactly fits in with this description. The figure below is for 4000 BCE.



Bhishma lying on arrow bed could not have narrated this story of the olden times in 5561 BCE, of Nilesch Oak's time line! All the Sapta Rishis had not yet returned in 5561 BCE! (Figure below)
All simulations are for Hastinapur.

2. Arundhati was part of a migration of Sapta Rishis.

Another story of Arundhati suggestive of a *migration of people*³⁵⁵ *subsisting on Sibi* (**Typha angustifolia**) to lotus eating places has different set of Sapta Rishis indicating a different era. Sibi is an edible plant in regions around Altai and Lotus eating people are there even today in Vietnam, Thailand and Burma. These three south Asian countries were collectively known as **Indra Dweepa** with the main river named after Indra. While a lot more research is needed in this section, I am restricting myself to pointing out a long forgotten story of a migration made out from the story of Arundhati that could have happened when the configuration of the Sapta Rishi Mandala was different from now.

3. Arundhati insulted her husband and became smoke coloured.

This episode was already discussed in the context of nimitta. The description is such that Arundhati poured scorn or fire (**वीरमअवमेने**- vīram avamene) on Vasishtha and became smoke coloured.³⁵⁶

Similar description comes in Vālmiki Ramayana of *Hanuman comparing the appearance of Sita in Ashoka Vana with Arundhati who was angry with Vasishtha*.³⁵⁷

The common feature in both descriptions is anger and giving rise to a change in the appearance. Mahabharata description is more explicit on the colour of Arundhati at that time.

An amazing reference to red colour for Arundhati comes from the Tamil Sangam text, Padirru Patthu³⁵⁸, wherein the star **ARUNDHATI IS MENTIONED AS RED IN COLOUR!** (Chemeen செம்மீன்)

Interestingly recent researchers have identified a dwarf companion for Arundhati (Alcor) that is red in colour! Two independent teams of astronomers have found out that *Arundhati is*

³⁵⁵Mahabharata: 13-93 <http://ancientvoice.wikidot.com/src-mbh-13:section-93>

³⁵⁶Mahabharata: 1-224 -27 to 29

³⁵⁷Valmiki Ramayana: 5-33-8

³⁵⁸Padirru patthu 31 – 28, 29

*being circled by a red dwarf companion star, a spectroscopic binary.*³⁵⁹ Based on the orbital motion of the companion star,³⁶⁰ the appearance of Arundhati will keep changing, at times reddish or smoky purple. She has appeared as a vitiated centre of the navel in the Mahabharata description by sage Mandapāla.

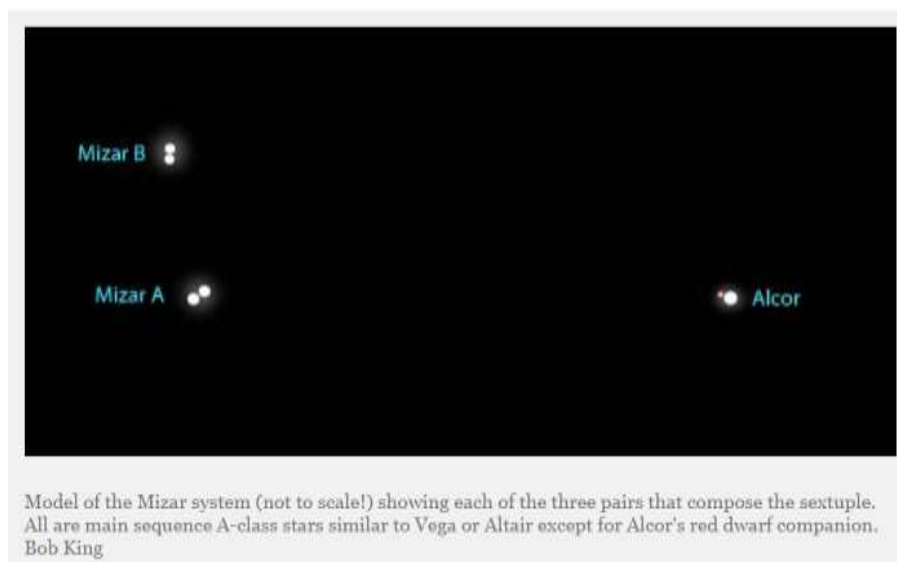


Figure 38: The sextuple system of Alcor- Mizar stars (Picture source)³⁶¹

The above image shows the system of sextuples of Mizar (Vasishtha is a binary, each with two stars) and Alcor accompanied by a red dwarf. Researcher Mamajek believes that there must be another star or a planet circling Alcor as Alcor's body doesn't look perfectly round.

The red companion solves the above quoted three references. *There must have been times Alcor was seen as a red star, making people wonder whether she was angry with her husband.*

(Hanuman's version) The reddishness seems to have made Arundhati appear as smoky and not clear with a vitiated centre. (Mandapāla's version) *The Tamil Sangam poem that refers to Arundhati as a red star was composed before the Common Era.* So it is reasonable assume that Arundhati had appeared red for quite some time before the Common Era. There is a qualitative difference between the description in the Tamil verse and those from Mahabharata and Ramayana, in that Arundhati was perceived as being angry in the references in the Epics but not so by the Sangam poet / people!

³⁵⁹ "Mizar – A Fresh Look at an Old Friend" <https://www.skyandtelescope.com/astronomy-blogs/explore-night-bob-king/mizar-a-fresh-look-at-an-old-friend03252015/>

³⁶⁰ Mamajek et al., "Discovery of a Faint Companion To Alcor Using MMT/AO 5 μ m Imaging" <https://iopscience.iop.org/article/10.1088/0004-6256/139/3/919>

³⁶¹ "Mizar – A Fresh Look at an Old Friend" <https://www.skyandtelescope.com/astronomy-blogs/explore-night-bob-king/mizar-a-fresh-look-at-an-old-friend03252015/>

The anger element was obviously attributed to the **reddishness**. Whenever Arundhati appeared red – which we know now was due to her reddish companion – she must have been perceived as a red spec too close to Vasishtha, making the observer think that she is picking up a fight with him or angry with him. When the reddishness is gone, she could have appeared in her original self as too close a companion of Vasishtha. This discussion conveys the following:

Ramayana happened at a time when Arundhati looked red. Mandapāla's version of Arundhati story also must have happened during such time she appeared red.

THROUGHOUT THE PERIOD OF THE SO-CALLED EPOCH, PEOPLE COULD NOT VISUALLY DETECT ARUNDHATI IN FRONT OF VASISTHA – THIS IS PARTICULARLY SO IN THE NON-CIRCUMPOLARITY PERIOD BEFORE C.7500 BCE. If they had detected, they would have recorded it but before doing that, the star Alcor (Arundhati) would have been stripped of the status as Arundhati!

The frequency of the red companion star coming in the line of vision for the terrestrial observer is not known. The last time it was visually recorded was some time during the period of the Tamil Sangam. The absence of any alarming reaction to its reddishness goes to prove that reddishness was noticed for quite a long time and therefore was accepted as normal appearance. (In contrast the reddishness was not detected anytime in the Common Era)

How often Arundhati was seen in reddish hue is not known. Whether she was seen with reddish hue during the traditional date of Mahabharata is also not known. But a red coloured companion does create differences in perception is a scientific fact I will be discussing after stating the facts on why A-V stars appeared with changing RA from normal.

The 'Peculiar Orientation' was due to change in ecliptic obliquity.

In his book Nilesh Nilkanth Oak proposed two main reasons for the change in the RA values of the two stars that caused Arundhati 'walk ahead' of Vasishtha.

Change in the proper motion of the stars.

'Peculiar orientation' that the North Pole star made with respect to the A-V stars.

He is often found repeating the first point, i.e. proper motion as the cause for the change in the relative RA of the two stars. One such view of his reproduced below from his 2016 blog.³⁶²

The phenomenon of 'precession of equinoxes' is indeed cyclic and it is part of the reason Arundhati (A) was seen as walking ahead of Vasishtha (V), during 11091 BCE – 4508 BCE.

However there is another phenomenon called 'proper motions' of stars and the magnitude and direction of proper motions for Arundhati and Vasishtha are such that Epoch of Arundhati (11091 BCE – 4508 BCE) is the only instance, as far as past is concerned, when Arundhati walked ahead of Vasishtha.

This means no plausible timing for Mahabharata war before 11091 BCE and also after 4508 BCE. NO IFS and/or BUTS

IN HIS BOOK HE SAYS THAT THE PHENOMENON OF ARUNDHATI WALKING AHEAD OF VASISHTHA IS GOING TO REPEAT IN C.13000 CE.³⁶³ *This assertion rejects his first reason stated above. If the change in RA was due to change in proper motion, it raises a question why it reversed after 4508 BCE. Again if the RA is going to decrease for Arundhati in c.13000 CE, does it mean that proper motion is going to change from what it is now? **THIS CREATES A CASE FOR FLUCTUATING PROPER MOTION CAUSING TO AND FRO MOVEMENT OF THE STAR.***

This is against the current scientific view that **the two stars share a common proper motion**, which means there is no likelihood of a deviation between the relative speeds of the two. Dr Harish Saranathan confirmed that the change in the relative position of the two stars in terms of proper motion is negligible for the last 12,000 years.

The cause for the changed RA in a specific period of 6000 years in the past and once again in future can *be traced to a change in the ecliptic obliquity*. Between 26,000 BCE and 2018 CE, the A-V pair appeared inclined to the ecliptic by a difference of just one degree. However between 12,000 BCE to 2,000 BCE it reached the maximum obliquity of 24°+ to the ecliptic when seen from the earth.

This is in tune with the settings of the software based on the **Milankovitch cycle of change in the ecliptic obliquity within just two degrees** between 22.1° and 24.5° spanning across 41,000 years.

The software simulation set to this value shows the A-V pair along with the Saptarishi Mandala (other constellations too) at an oblique angle (as seen from the earth) thereby showing a change in the RA of the A-V stars.

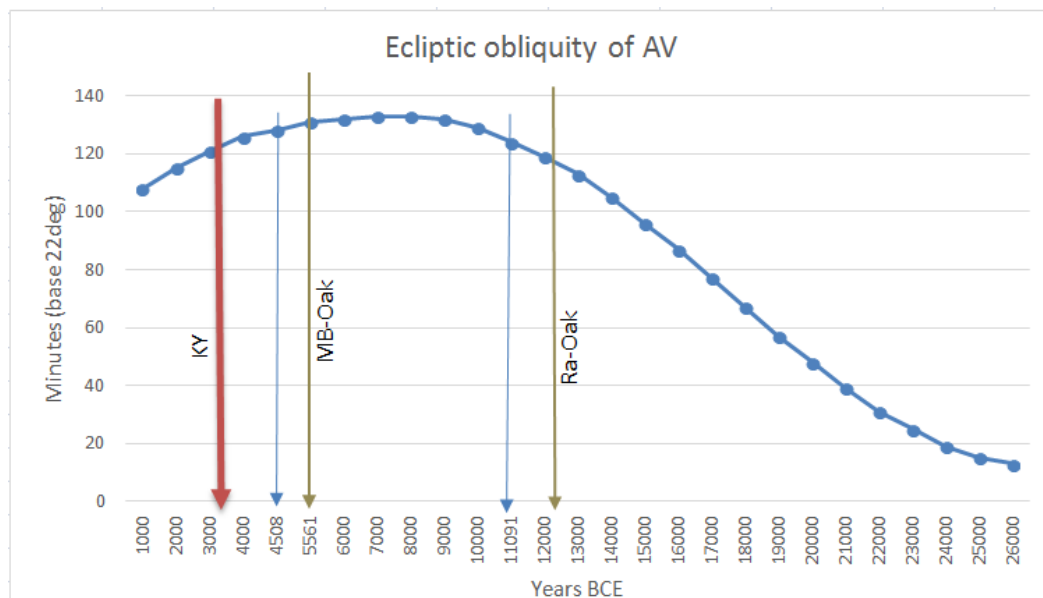
³⁶²“Antiquity & Epoch(s) of Arundhati” <https://nileshoak.wordpress.com/2016/05/16/antiquity-epochs-of-arundhati/>

³⁶³“When Did The Mahabharata War Happen?” page 67

Let us be mindful of the fact that any new theory replacing this concept would derail the changed RA values of the two stars.

Let us also remain informed of the fact that it is not proper motion of the A-V stars that caused this change in the look, as Nilesch Oak thinks.

The Obliquity angles taken up from Stellarium software is mapped as a graph.



The graph shows Nilesch Oak's Ramayana (Ra-Oak) and Mahabharata (MB-Oak) dates in the higher oblique period. *The traditional date of Kali Yuga (KY in the graph) happened at a time of decreasing obliquity.* In effect, *Nilesch Oak has positioned Mahabharata and Ramayana when the earth's path around the sun reached the maximum obliquity.* **THAT WAS THE TRUE IMPLICATION OF HIS SO-CALLED EPOCH OF ARUNDHATI!**

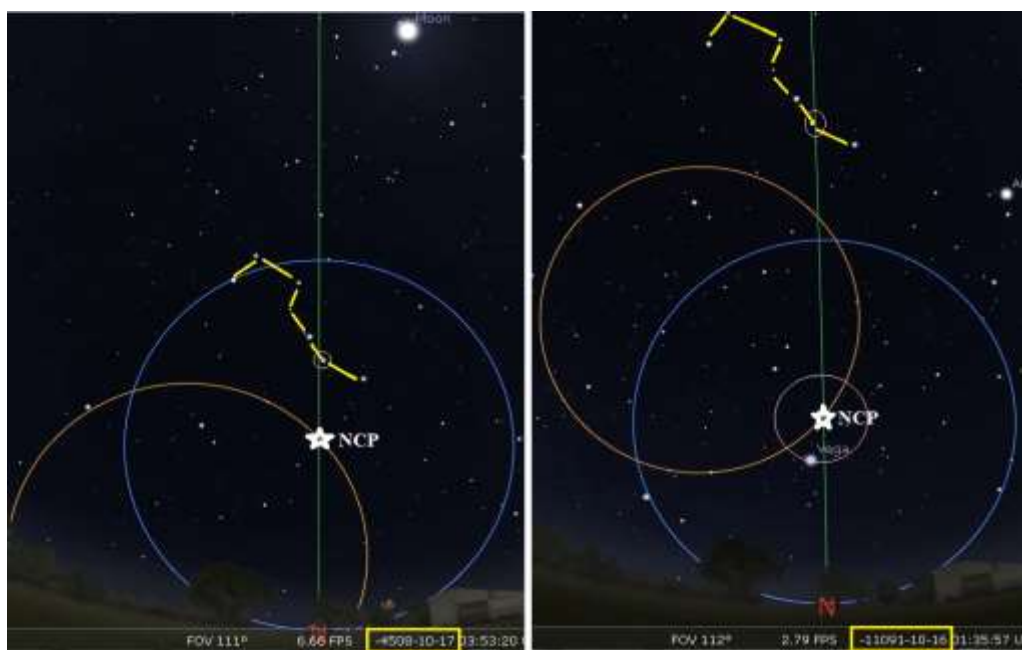
The so-called Epoch of Arundhati marks the period of the ecliptic reaching the maximum obliquity.

This is my serendipitous discovery from Nilesch Oak's Epoch!

When the obliquity was more, the angle of view from the earth was different, and the entire constellation appeared different from normal. Same was true of the oblique setting of Cassiopeia constellation that caused Rachbah to set earlier than Navi around 12,000 BCE. These constellations appeared in slanting position when viewed from an oblique angle. In reality this has nothing to do with change in relative proper motion of A-V stars.

The following figure gives the view of the Sapta Rishi Mandala in the entry and exit years of the so-called Epoch of Arundhati which was actually a period of maximum ecliptic obliquity.

The figure at left is for exit date (4508 BCE) and at right for entry date (11091 BCE) of Niles Oak's Epoch. The entire constellation did not appear as an inverted ladle but as a slanting one. The slanting position did not continue with the same appearance throughout the journey across the sky. Within a single day it changed from what is normally below to an upright position and returned to normal.



Left: 4508 BCE.

Right: 11091 BCE

The following figure shows the oblique movement of the entire constellation along with Niles Oak's window for a day in 8000 BCE. I have circled the A-V stars for easy recognition.



The appearance of Arundhati relative to Vasishtha kept changing throughout the 24 hour period. Arundhati appeared forward of Vasishtha at particular angles (though she was maintaining her position at the back of Vasishtha), but once the constellation started descending, Vasishtha gained forward appearance. It's quite appalling to see Nilesch Nilkanth Oak pick out the movement through a small window in his simulator and claim a scientific break-through!

Scientific explanation for A-V verse of Vyasa.

Among all Mahabharata researchers, only Vartak and following him Nilesch Oak thought that the A-V appearance was a true astronomy feature. The fact is that not only Arundhati-Vasishtha, but **FOUR OTHER CELESTIAL ENTITIES ALSO PRESENTED DIFFERENT APPEARANCES** around the same time. In all, three stars and three planets had appeared differently in the nimitta observations of Vyasa and Karna. The sad fact is that Nilesch Nilkanth Oak, the self-proclaimed scientific researcher is not at all aware of the other deviations mentioned in the text. For him, the fascination to prove that Arundhati violated her *pati-vratā* code is all that matters.

A closer scrutiny reveals a common thread running through the deviation reported in all the six celestial entities –that can be best explained by a scientific phenomenon called ‘**Atmospheric refraction**’. There is substantial number of corroborative references in the words of Vyasa in the very same context of A-V observation which Nilesch Oak had greatly ignored, that point out to a drastic change in the atmospheric refractive index as an after-effect of a natural calamity. Nilesch Oak's only focus was on selective search of astronomy related words from the text, by turning a blind eye to the background context. He does say that he restricted himself to astronomy references internal to Mahabharata text³⁶⁴ but failed to note the atmospheric conditions revealed by Vyasa in the same context.

The atmospheric descriptions noted by Vyasa as nimittas do indicate a sudden occurrence of a natural calamity in India or elsewhere impacting the atmospheric conditions and the density of air at different levels, thereby causing a change in the refractive index of the air at the surface of the earth from where the A-V observation was made. The change was different from how it used to be under normal conditions. As an astute astronomer, being aware of the changes, Vyasa noticed the different changes at that time, all of which point out to a change

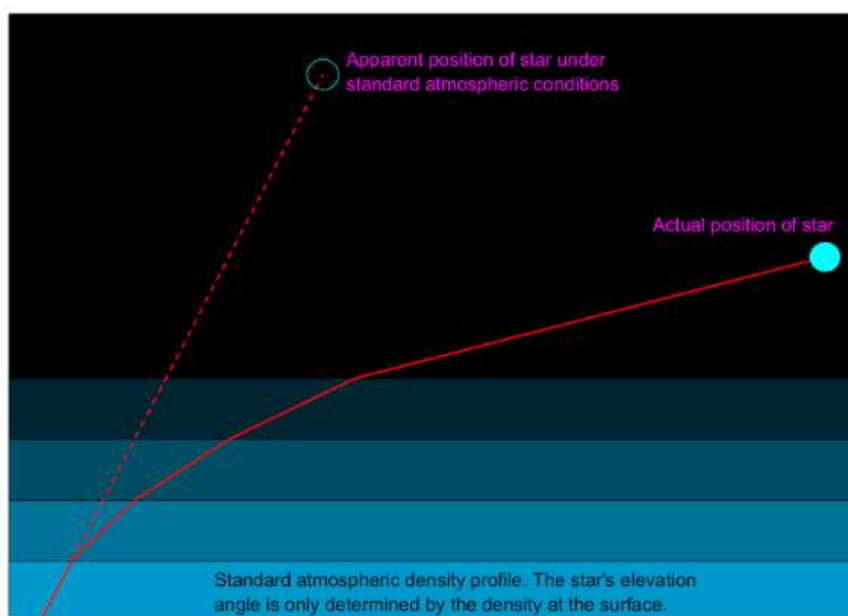
³⁶⁴“When Did The Mahabharata War Happen?” Page 159

in atmospheric refraction causing the change in the appearance of the A-V stars and also the Pole star.

Brief note on Atmospheric refraction.

The light from the star passes through the vast emptiness of space (vacuum) before entering the earth's atmosphere. It travels with no obstruction on the way to bend it or refract it.

Therefore the refractive index of vacuum is 1. Once the light ray enters the atmosphere it undergoes deflections caused by the different layers of atmosphere. The star light is refracted differently in different layers causing it to appear twinkling. In reality the refractive deflections through the layers get cancelled out and the final refraction is determined by the refractive index at the ground level atmosphere. *If the density is higher, which is the standard condition always, the light ray is refracted towards normal.*

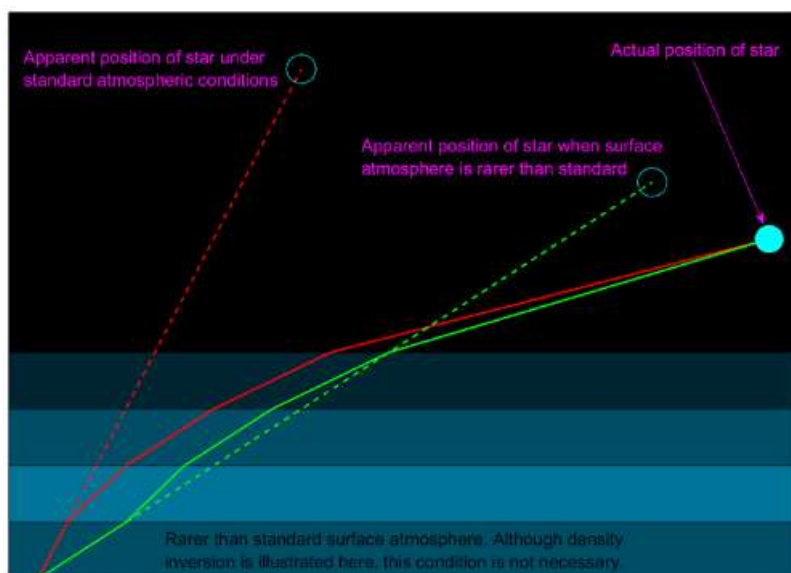


Near the horizon the light ray has to take a longer path through denser atmosphere. This causes the ray to refract more towards normal causing a slight shift in the apparent position of the star. The shift always happens **towards the zenith**. The above diagram describes this phenomenon.

Imagine the same phenomenon happening to **two stars in a binary system such as Arundhati-Vasishtha**, the shift in position will be there for the two stars, with the wave length of their light also becoming a crucial factor in influencing the extent of the shift. One must remember that the **light from Arundhati blended with a reddish spectral binary** has a different refractive index than the blue or white light of Vasishtha!

Now let us see how the star light behaves if the ground level density is rarer than the upper levels. This is not a regular feature, but happens under extraordinary circumstances. If it is very hot, the atmosphere at the surface becomes rarer. The star light passing through rarer atmosphere refracts less towards normal. In the following diagram, the shift in the position of the same star under two conditions – denser and rarer – is illustrated.

The red-lines depict the deviation in appearance under standard atmospheric conditions; the green lines, under rarer atmosphere. The dotted red line shows the apparent position of the star under standard atmospheric conditions as its light is bent more towards normal. In contrast the green line refracts away from normal under rarer atmospheric conditions. The dotted green line shows the apparent position of the star in this condition.



One can see that the shift in the apparent position of the star is less in rarer conditions. But under no conditions, the refractive index becomes negative which means the apparent position of the star can never go below the actual position. In simple terms the star cannot be seen to move to our right or clockwise even if the ground level density is rarer than upper levels.

With this scientific knowledge, it is quite shocking to read Vyasa's verse that **the Pole star had moved clockwise** – a condition that is impossible both under standard or even rarer atmospheric density. This prompts us to take a deeper look at what Vyasa has stated.

Two nimittas on changed refractive index

Of the numerous nimittas mentioned by Vyasa, two stand out as exceptions from normal occurrence of the differing refractive indices of the atmospheric layers from top to the ground.

The nimitta of the North Pole star doing a clockwise movement is the first major indicator of changed refractive index at that time. The pole star in the traditional date of Mahabharata was **Thuban** in modern astronomy software (none in Nilesch Oak's date of Mahabharata) and it was 2° away from the NCP at that time. It was circumambulating the NCP in anti-clockwise direction. By having said that it went '**apasavya**',³⁶⁵ it is understood that he has seen it move towards right or away from zenith! This is totally not agreeable with atmospheric refraction under normal conditions. The exact verse of Vyasa is reproduced below:

dhruvāḥ³⁶⁶ prajvalito ghoram apasavyam pravartate (6-3-16)

{Vyasa refers to "**Dhruva**" which is normally taken to mean the pole star, but it must be noted here that only one among the pole stars was known as Dhruva as per scriptures and **not all the pole stars were Dhruva**. Assuming that this verse refers to a particular star identified as Dhruva, it doesnot alter our stance, for, this star though not necessarily the pole star of Mahabharata times, was anyway close to the polar region, and circumambulating the then pole star in anti-clock wise direction. *This star could never move clockwise, but it did is what is understood from this verse.* Since Nilesch Oak has worked with the modern astronomy software, **I will continue to refer to the positions as per the modern software**, by which it is conveyed that Dhruva will be treated as the North Pole star shown in the software. It was Thuban for the traditional date of Mahabharata, but none in Nilesch Oak's date}

Vyasa must have been very well aware of the phenomenon of atmospheric refraction. But on that particular day, he had seen the pole star move in the wrong direction and that is why he had identified it as a nimitta, something not ordinary and not repeating!

The colour of a planet or a star at the lower horizon follows a pattern in general. The atmosphere acts as a prism at lower heights of the atmosphere, for the star light or the planetary rays to split into its component colours each according to their wave length (VIBGYOR).

³⁶⁵ Mahabharata: 6-3-16 <http://www.sacred-texts.com/hin/mbs/mbs06003.htm>

³⁶⁶ In the 7200 year cycle of Siddhantic concept of precession, Dhruva always refers to Polaris. If the reference here was about Polaris, then also the right shift of Polaris is impossible to happen, for, it always stays within circumpolarity around the other pole stars of the cycle and goes from right to left and never from left to right.

“Differential refraction produces a height shift of the image of a star above horizon. Blue light is deviated more than red light and thus the image of a star close to the horizon appears like a small spectrum with blue up and red down.”³⁶⁷

More often, only the bottom will appear red for stars and the two luminaries. Contrary to this natural occurrence, *Vyasa had noticed two planets (grahau) appearing with coppery red top and therefore he identified it as a nimitta*. This was noticed while the Sapta Rishis were rising with obscured lustre!³⁶⁸

*grahau tāmraṇa śikhau prajvalantāv iva sthitau
saptarṣīṇām udārāṇām samavacchādyā vai prabhām (6-3-24)*

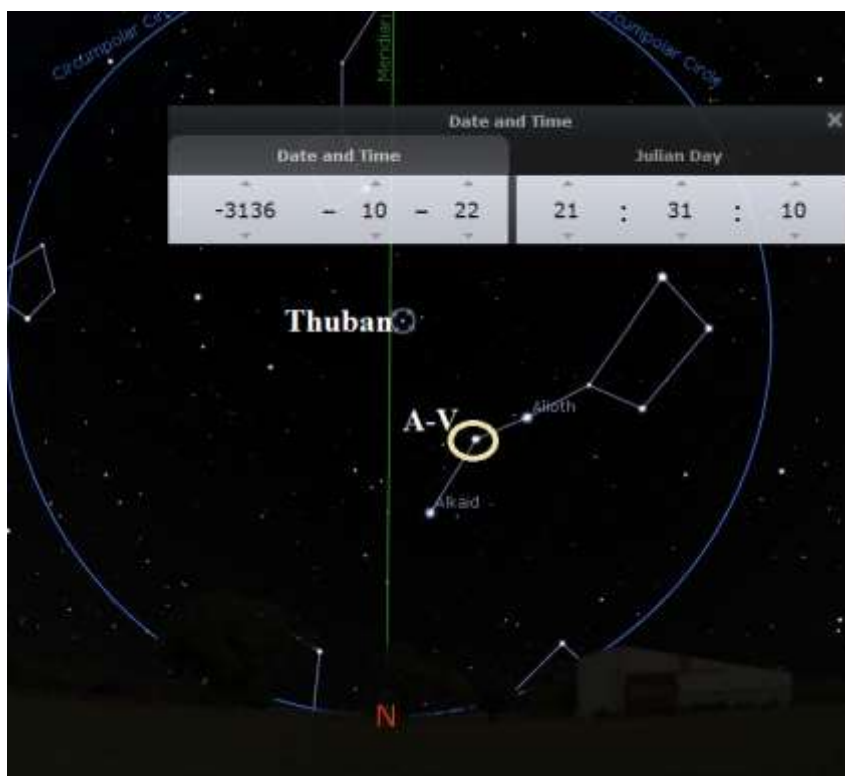
No planet except **Mars** appears red. Here Vyasa refers to two planets appearing with red top. In the same context Vyasa has mentioned seeing Arundhati putting her husband at her prishtha (back) and also a contradictory statement that the Saptarishi Mandala looked lack-lustre - raising a question on how then he was able to see the changed position of the A-V pair so clearly. In the same context Vyasa has listed down many features as nimitta that are related to causing variation in the atmospheric layers in terms of density, heat and humidity – the factors that cause refraction of the light-ray. More importantly the star- deviations reported by him (that include A-V stars) **can be seen at lower atmosphere as the latitude of Hastinapur is little less than 30° (29.1569°N)**.

The latitude of the place determines the height at which NCP (North Celestial Pole) appears in a place. The NCP appears at an elevation in a place that is equivalent to the latitudinal degree of that place. At Hastinapur the NCP appears at 30° (29.1569°) from the horizon. The Sapta Rishi Mandala, when it is moving below the NCP, will be closer to horizon, becoming vulnerable to differing images caused by atmospheric refraction.

So we have to first check the location of the Sapta Rishi Mandala in Hastinapur sky in the year Krodhi (in 3136 BCE, i.e. 35 years before 3101 BCE, proved earlier as the Kali Yuga start year in Pramathi), in the months starting from Kartika. Stellarium simulator showed Sapta Rishi Mandala near the horizon after sunset on all the three months starting from Kartika. The following figure was seen in Pushya month, on 22nd October in Julian calendar. On the same night it was above the NCP (south of NCP) at pre-dawn hours at a height of more than 30° where atmospheric refraction is less. So the A-V observation as reported by Vyasa was possible only after sunset.

³⁶⁷ “Spectographs and related instruments” <https://www.astrogeo.va.it/astrom/spettri/atmosferen.htm>

³⁶⁸ Mahabharata: MB 6-3-24 <http://www.sacred-texts.com/hin/mbs/mbs06003.htm>



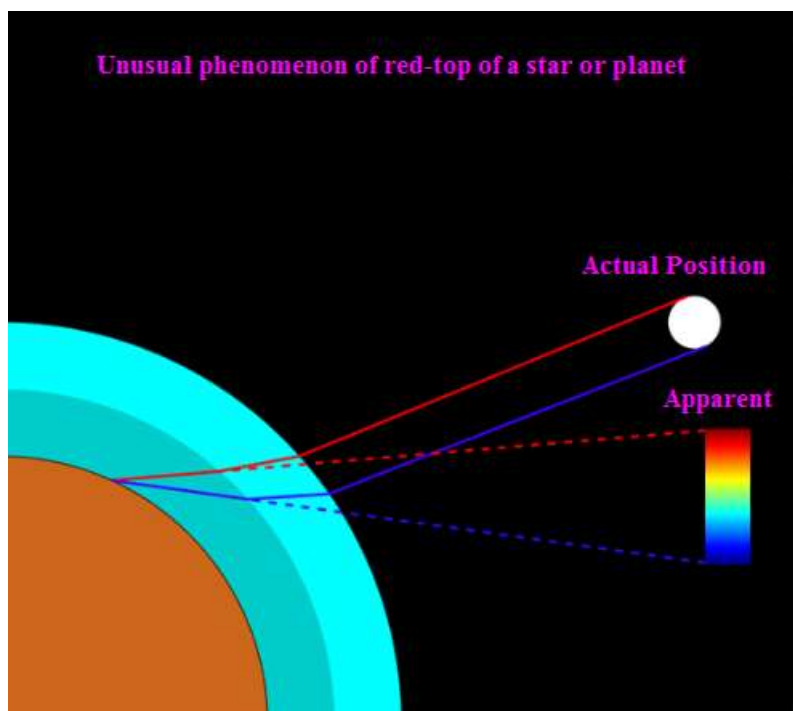
At 7-30 PM in Hastinapur in the year Krodhi, Pushya lunar month.

22nd October 3136 BCE.

This position of A-V stars of the Sapta Rishi Mandala looking ideal for giving refracted appearance, my next task is to establish that reversal of atmospheric refraction did happen around that time.

I discussed this with Dr Harish Saranathan and he gave the following explanation along with a graph for **red-top for a star or planet at horizon**.

*“The inversion of the spectrum (red appearing over top) may occur if the refractive index of the air is less than unity. This would mean that the speed of light is faster than 299572458 m/s, the speed of light in vacuum. However, for calculating refractive index, it is the phase velocity (the velocity at which the crests of the electromagnetic wave of the light move) that is used, which can be faster than this value. This can occur naturally at close to resonance frequencies, for absorbing media, in plasmas, and for X-rays. An example of plasma with an index of refraction less than unity is Earth's ionosphere. However note that we need the refractive index to be less than unity **AT THE SURFACE** of the Earth”*



The reversal of the colours near horizon cannot happen under normal conditions. The North Pole star had moved away from zenith (clockwise). In the same context Arundhati had appeared to have kept Vasishtha at her Prishṭha, that is, to her right! In the same context Vyasa and Karna had noticed shimmering of the moon's surface or changes in the poke marks of the moon! Except these, most of the other nimittas are directly indicative of a natural calamity!

I picked out all the nimittas suggestive of a natural calamity that appeared to have been caused by fragments of comet or an asteroid hitting not only the earth but also the moon simultaneously! I shared them with Dr Harish Saranathan and sought his opinion. He did concur with my view of an asteroid impact causing numerous odd changes that were recorded as nimittas. He told that an asteroid hit causes a plasma trail and plasma explosion, ionising the air temporarily. This gives scope for negative refractive index of the atmosphere for a short time after the asteroid-hit.

Then I started searching **for scientific analysis on asteroid hits** in the past and came across valuable inputs in support of plasma theory causing temporary ionisation in nature.

- Every time lightning strikes, it causes a plasma trail, though temporarily.³⁶⁹

³⁶⁹“How Lightning works” by John Zavisa <https://science.howstuffworks.com/nature/natural-disasters/lightning2.htm>

- The radio signals are sent making use of the ionised trail caused by meteor showers. The refractive index is negative in such cases.³⁷⁰
- The analysis of the deadly asteroid-hit that wiped out dinosaurs from the earth 66 million years ago gives a description that matches with odd occurrences in Mahabharata.³⁷¹
- The asteroid-hit at Chelyabinsk also confirmed plasma trail.³⁷²

Based on these inputs I reconstructed the calamity based nimittas and shared with Dr Harish Saranathan for his assessment. He responded,

“The asteroid impact theory here as atmospheric re-entry (and possibly impact with Earth) will and does produce plasma. The particulate matter in the atmosphere can alter the refractive index of the atmosphere, and scatter the light depending on its wavelength. The source of this matter can be smoke, volcanic ash, meteor strike, etc.

In addition to altering the apparent star position, these phenomena can also cause the observed shimmering effects (on the moon).

The meteor strike might also be the source of the roar, and seismic activities resulting in the ground trembling. Meteor strike/seismic activity in oceans can lead to tsunamis. The disturbed particles falling back to the oceans and rivers can muddy them.”

I am sharing here the nimittas with explanations. The earliest reference to such a calamity appears in the conversation that Karna had with Krishna during the peace mission in lunar Kartika month. Therefore the versions of Karna and Vyasa are analysed together to know the exact nature of the calamity and the resultant changes in the atmospheric density. Fortunately this analysis has given us the exact date of the asteroid-hit.

Nimittas that suggest asteroid-hit.

A thorough analysis of the nimittas narrated by Karna is indicative of “**UTPATA LAKSHANA**”³⁷³ (natural calamity). These were expressed by Karna after Duryodhana ordered his troops to be moved on the same day when moon was transiting the star Pushya. Pushya is auspicious for doing Royal Bath followed by Pushya Homa by the king who wants victory.³⁷⁴

³⁷⁰ “Meteor Burst Communications” https://en.wikipedia.org/wiki/Meteor_burst_communications

³⁷¹ “What really happened when the ‘dino killer’ asteroid struck” By Jane Palmer <http://www.bbc.com/earth/story/20160415-what-really-happened-when-the-dino-killer-asteroid-struck>

³⁷² “Chelyabinsk: Portrait of an asteroid outburst” <https://physicstoday.scitation.org/doi/full/10.1063/PT.3.2515>

³⁷³ Mahabharata: 5-141-26

³⁷⁴ Brihat Samhita: Ch 48

Brihat Samhita also informs us that (1) Royal bath in Pushya star was recommended as a remedy from calamities (2) When bad omens were sighted, the King has to do Pushya Homa and Pushya bath within 7 days to erase diffuse the effect of the omens. (3) New omens are noticed on Pushya bath day to predict future (5) Omens at the end of Pushya Homa were checked before undertaking travel. And nimittas were watched at the end of the homa to know the outcome of the war. On that day, NIMITTAS DID OCCUR BUT THEY WERE TERRIBLE. Let me list out the nimittas found to be similar in the versions of Karna and Vyasa. I am also giving the version of Niles Oak alongside to let the reader know where he stands in his understanding of Mahabharata.

Natural calamities:

Karna: Meteors (Ulka) were falling from the sky with loud noise. There were whirlwinds accompanied with earthquakes.³⁷⁵

Vyasa: dhūmaketur mahāghoraḥ puṣyam ākramya tiṣṭhati (6-3-12)

Vyasa: anabhre ca mahāghoraṁ stanitaṁ śrūyate 'niśam (6-2-33)

Vyasa: abhīkṣṇaṁ kampate bhūmir (6-3-11)

Vyasa says explicitly that a comet attacked Pushya. Many researchers have treated this as sighting a comet near Pushya, but it turned out to be an attack on the earth on Pushya day!

Niles Oak recognises this as Haley's comet from his Voyager-Simulator Nyaya, though it was not visible at that time.³⁷⁶ It doesn't matter if it was not visible because in Niles Oak's scheme, Mahabharata people having the ability of seeing Uranus, Neptune and Pluto³⁷⁷ in some way could have seen the unseen Haley's comet too.

Karna: The wells in the midst of Duryodhana's encampment sent forth loud roars like those of huge bulls.³⁷⁸ - This can happen in the event of earthquakes or tectonic movement.

Vyasa: phenāyamānāḥ kūpās ca nardanti vṛṣabhā iva (6-3-32)

Vyasa: pratisroto 'vahan nadyaḥ saritaḥ śoṇitodakāḥ (6-2-32)

Niles Oak is silent on this obviously because these are not astronomy references and so he didn't care to read them.

Karna: There were showers of flesh and blood.³⁷⁹ – This can happen with tornado like whirlwinds lifting animals or red mud and pour them down elsewhere.

³⁷⁵ Mahabharata: 5-141-10 <http://www.sacred-texts.com/hin/mbs/mbs05141.htm>

³⁷⁶“When Did The Mahabharata War Happen?” Page 94

³⁷⁷Ibid. Page 95

³⁷⁸Mahabharata: 5-141-20

Vyasa: *āsīd rudhiravarṣaṃ ca asthi varṣaṃ ca* (6-2-30)

Vyasa: *māṃsavarṣaṃ punas tīvram āsīt kṛṣṇa caturdaśīm* (6-3-31)

(Reference to Krishna Chaturdasi indicative of a later time)

Immediately after referring to the shower of blood and ashes Vyasa refers to the **ARUNDHATI-VASISHTHA OBSERVATION.**

Nilesh Oak's Voyager has nothing to do with this description or even the Krishna Chaturdasi mentioned by Vyasa. Interestingly Krishna Chaturdasi is a crucial input in deciding the month of the war. It will be discussed in the next chapter.

Karna: Vapoury edifices of great effulgence with high walls, deep trenches, and handsome porches, are suddenly appearing in the skies.³⁸⁰ - This could be the case of “**SUPERIOR MIRAGE**” when objects on the ground are reflected above them due to a process called **‘TEMPERATURE INVERSION’** and changed atmospheric index from greater to lower from ground to top layers.³⁸¹ This appearance is possible near water bodies. The troops of Kauravas and their supporters must have been staying in tents near the river Ganga. When the upper atmospheric layers were hot as an after-effect of asteroid hit that happened elsewhere, the cold air near the Gangetic shores where the army barracks had been set up causes the superior mirage in the sky of the structures on the ground. This is a temporary sight and as such a nimitta.

Vyasa does not mention anything similar to this. So the above appearance of ‘temperature inversion’ was an initial event soon after the asteroid-hit, noticed on the banks of the Ganga by Karna. Nilesh Oak's simulator Nyaya has nothing to do with this.

Karna: A black circle called ‘*Parigha*’ surrounding the solar disc appears to the view. “*kṛṣṇaś ca parighas tatra bhānum āvṛtya tiṣṭhati*”³⁸²

In the case of asteroid hits or volcanic eruptions, the dust, fumes and ash thrown into atmosphere appear as black halo around the sun. In the absence of any reference to a volcanic

³⁷⁹Mahabharata: 5-141-21

³⁸⁰ Ibid.

³⁸¹Refer this link on ‘Optical Phenomena’ https://www.eoas.ubc.ca/courses/atc113/sailing/met_concepts/10-met-local-conditions/10f-optical-phenomena/

³⁸²Mahabharata: 5-141-22

eruption, the asteroid hit(s) at some place other than Hastinapur had caused this image. **Brihat Samhita speaks about Parigha** and its effects in quite a few places.³⁸³

*Vyasa: śvetalohita paryantāḥ kṛṣṇa grīvāḥ sa vidyutah
trivarṇāḥ parighāḥ saṁdhau bhānum āvārayanty uta (6-2-21)
(Tri-coloured Parigha is reported with a black ring around the sun)*

Vyasa's observation of tri-coloured Parigha must have happened long after the asteroid-hit. Such appearances sustain for a prolonged period after an asteroid hit.

Nilesh Oak does not care to study the contextual inputs in A-V observation.

Planetary nimittas in support of asteroid-hit:

Only **five planetary nimittas** have been narrated by **Karna**, compared to many by Vyasa. However Karna's planetary nimittas can be termed as being witnessed soon after the asteroid hit – on the day of Uttara Phalguni, the 4th day after the asteroid hit. This is deduced from Krishna's advice to Karna at that time that Amawasya was going to occur in Jyeshtha after seven days. (*saptamāc cāpi divasād amāvāsyā bhaviṣyati*)³⁸⁴

Vyasa's version on nimittas come much later though some of them match with Karna's observation helping us infer that Vyasa had observed the astronomy and environmental features soon after the asteroid-hit. They offer the best clues on picking out among the others, only those planetary nimittas of Vyasa that were noticed by him at the time of the asteroid hit. Before we go ahead with discussing them, let me deduce the time of the asteroid hit that happened in the year Krodhi (35 years before the start of Kali Yuga), in the lunar month Kartika³⁸⁵ when moon was in Pushya. Using the Surya Siddhanta ayanamsa (Vernal equinox at zero degree Aries) the day simulated from the astrology software coincided with **SEPTEMBER 2, 3136 BCE** (Figure 39).

³⁸³Brihat Samhita: Ch 30 & 47

³⁸⁴Mahabharata: 5-140-18

³⁸⁵Details of why it is Kartika is given in next chapter.

Body	Longitude	Nakshatra	Pada
Lagna	20 Ta 52' 24.18"	Rohi	4
Sun - GK	9 Sc 15' 02.89"	Anu	2
Moon - PK	13 Cn 43' 46.73"	Push	4
Mars - AmK	27 Sc 43' 25.57"	Jye	4
Mercury - MK	22 Li 05' 34.14"	Visa	1
Jupiter (R) - DK	5 Ta 59' 05.78"	Krit	3
Venus (R) - AK	28 Sc 43' 47.37"	Jye	4
Saturn - PiK	21 Cp 59' 55.74"	Srav	4
Rahu - BK	3 Le 58' 39.72"	Magh	2
Ketu	3 Aq 58' 39.72"	Dhan	4

Date:	September 2, -3136	Tithi:	Krishna Shashthi
Time:	5:30:00 pm	Vedic Weekday:	Tuesday (Ma)
Time Zone:	5:30:00 (East of GMT)	Nakshatra:	Pushyami (Sa) (22.03% left)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India	Sunrise:	6:00:34 am
Lunar Yr-Mo:	Krodhi - Karthika	Sunset:	4:52:09 pm
		Ayanamsa:	0-30-56.92

Figure 39: An asteroid or fragments of a comet hit the earth on Sep 2, 3136 BCE

Let me analyse the planetary nimittas given by Karna to crosscheck with the planetary positions of the above chart. Let me also produce similar nimittas, found in Vyasa's narration to establish them to have occurred at the time of the asteroid hit.

1. Saturn afflicting Prajapati's star-planet

- Karna says,³⁸⁶

Karna: prājāpatyaṃ hi nakṣatraṃ grahas tīkṣṇo mahādyutiḥ
śanaīścaraḥ pīḍayati pīḍayan prāṇino 'dhikam

This is translated by **Ganguli** as,

"That fierce planet of great effulgence, Sanaischara (Saturn), is afflicting the constellation called Rohini, in order to afflict greatly the creatures of the earth."

PRAJAPATI'S STAR IS ROHINI, but here it could refer to two meanings as per astrology: (1) the other stars in the same class of Rohini namely Shravana and Hasta that are equi-distant from each other and form the corners of an equilateral triangle in the sky. (2) Moon, the planetary (Graha) dispositor of Rohini (and the other two of the same class). Earlier in Chapter 4, we established that "*Krittikasu Graha*"³⁸⁷ actually pointed out to Sun, the planetary dispositor of the star Krittika. Likewise Moon is the planetary dispositor of Rohini.

In the simulated chart for 2nd September, 3136 BCE, (given earlier) we find Saturn positioned in the co-star of Rohini that is, Shravana and in direct opposition to Moon. Though both

³⁸⁶ Mahabharata: 5-141-7 <http://www.sacred-texts.com/hin/mbs/mbs05141.htm>

³⁸⁷ Mahabharata: 6-3-26

interpretations are fulfilled here, this sighting being a nimitta, the position of Saturn in exact opposition to Moon in the zodiac must have been construed as Saturn casting its sharp (Teekshna) rays of light on the Moon, the graha of Prajapati star. By having afflicted it with his sharp rays, Saturn can be said to have caused harm to the praja and therefore the reference to Prajapati star. With the fast moving moon quickly moving out of direct affliction of Saturn, this coupling between Saturn and Moon is construed as a nimitta. The coupling between the two had happened at the time of asteroid hit! I am reproducing the chart for the same day but at little after sunset when the exact coupling between the moon and the Saturn started (Figure 50).

Body	Longitude	Nakshatra	Pada
Lagna	11 Ta 42' 51.56"	Rohi	1
Sun - GK	9 Sc 13' 46.73"	Anu	2
Moon - PK	13 Cn 28' 34.55"	Push	4
Mars - AmK	27 Sc 42' 30.78"	Jye	4
Mercury - MK	22 Li 05' 13.56"	Visa	1
Jupiter (R) - DK	5 Ta 59' 16.05"	Krit	3
Venus (R) - AK	28 Sc 44' 12.38"	Jye	4
Saturn - PiK	21 Cp 59' 50.96"	Srav	4
Rahu - BK	3 Le 58' 43.69"	Magh	2
Ketu	3 Aq 58' 43.69"	Dhan	4

Date:	<u>September 2, -3136</u>
Time:	<u>5:00:00 pm</u>
Time Zone:	<u>5:30:00 (East of GMT)</u>
Place:	<u>78 E 01' 00", 29 N 10' 00"</u> <u>Hastinapur, India</u>
Lunar Yr-Mo:	<u>Krodhi - Karthika</u>
Tithi:	<u>Krishna Shashthi (Ve) [Vajreswari]</u> (64.61% left)
Vedic Weekday:	<u>Tuesday (Ma)</u>
Nakshatra:	<u>Pushyami (Sa)</u> (23.93% left)
Ayanamsa:	<u>0-30-56.92</u>

Figure 40: Asteroid hit date (SS ayanamsa)

Except the nodes all the seven planets (that include the sun and the moon) planets have their orbs and are said to ‘catch’ each other when they come within the orbs. For Moon it is 8° and it is 9° for Saturn.³⁸⁸ At 5 pm on that day the orb of moon at 13° and that of Saturn at 21° started coupling with each other (Figure 16).

³⁸⁸³⁸⁸ Dr. B.V. Raman, “Varshaphal”, Page 16. The knowledge of orb is ancient as this was the basis for spontaneous prediction of calamities.

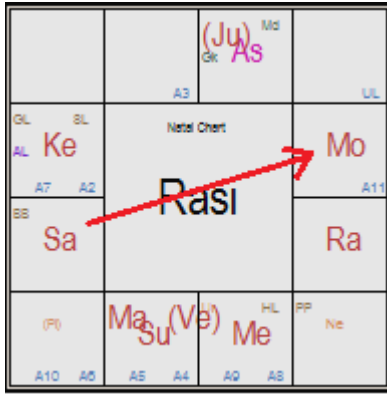


Figure 41: Planetary position at the time of Asteroid hit

The direct and teekshna affliction of Saturn on Moon happened until Moon left Cancer.

Vyasa also refers to Saturn’s affliction on Rohini.

Vyasa: *rohiṇīm pīḍayann eṣa sthito rājañ śanaīścaraḥ* (6-2-32)

Vyasa qualifies the reference with ‘एष सथितो’ – meaning, by standing in his place Saturn has sent its affliction. From its position in Shravana, it afflicts Rohini at the other end of the equilateral triangle formed by Shravana, Rohini and Hasta. It could also refer to what Karna meant – by afflicting the planet (moon), the planetary ruler of Rohini. So this nimitta by Vyasa is the same one described by Karna.

At the moment of hearing the sound of the asteroid-hit, Karna, Vyasa among others had noted down the position of Prajapati star, its planetary dispositor and the affliction caused to either of the two. They found that Moon was in direct line of contact with Saturn positioned in a star (Shravana) of the class of Prajapati (Rohini). That was noted down by Karna and Vyasa as a nimitta.

What does Nilesh Nilkanth Oak, the archaeo-astronomer say about this?

He doesn’t care to strain his brain about the date for this combination. He assumes that Vyasa had observed Rohini in pre-dawn western sky days before the war when Saturn was the only other planet in the eastern sky. From east to west the affliction had happened which he describes as ‘Yuddha’ or ‘Bheda’ between Rohini and Saturn.³⁸⁹

2. Planet Mars wheeling backwards to Anuradha.390

Karna: *kṛtvā cāṅgārako vakraṁ jyeṣṭhāyām madhusūdana*
anurādhām prārthayate maitraṁ saṁśamayann iva

³⁸⁹“When Did The Mahabharata War Happen?” Page 85

³⁹⁰ Mahabharata: 5-141-8

This is translated by **Ganguli** as

“The planet Angaraka (Mars), wheeling, O slayer of Madhu, towards the constellation Jyeshtha, approacheth towards Anuradhas, indicating a great slaughter of friends.”

In the above simulation, Mars was in Jyeshtha star. From the verse it is known that its true position was in Jyeshtha only. A movement towards the previous star, i.e. Anuradha can happen in retrogression, but *there was no retrogression at that time because Mars was on the other side of the Sun (as seen from the earth) and was seen closer to the Sun.*³⁹¹ And the observation being a nimitta, only a temporary appearance of movement must have been noticed.

Mars moving towards the previous star is same as Vyasa’s reference to

- (1) The North Pole star moving in apasavyam direction (away from zenith)
- (2) Arundhati keeping Vasishtha at her Prishtha (exchange of places by which Vasishtha shifted to Arundhati’s right)

THE RIGHT-WARD MOVEMENT OF MARS MUST HAVE BEEN CAUSED BY THE SAME CAUSES, NAMELY THE CHANGED OR NEGATIVE REFRACTIVE INDEX OF THE ATMOSPHERIC LAYERS.

Mars was at lower horizon in the west at that time closely following the Sun. Mars being a red planet, the deflection must have been more than under ideal conditions, thereby causing a right-ward shift for an observer on the ground, giving rise to an impression that it is moving towards Anuradha. Figure 17 shows the shift in the position of Mars towards Anuradha (arrow mark) caused by the changed refractive index.

³⁹¹ Retrogression of Mars or any outer planet can happen only when they are on the other side of the Sun, that is, with the earth in the middle and the Sun and the outer planet on either side of the earth. In the current discussion, Mars was on the same side as the Sun and much closer to it when seen from the earth. So retrogression of Mars is impossible in this situation.



Figure 42: Mars wheeling backward to Anuradha

Venus was also there in close quarters to Mars at that time. But no change in its position was noticed, presumably because its rays were white and not red. However it is highly likely that the two planets appearing with red-top in Vyasa's narration could be about Mars and Venus in the western sky soon after sun set.

It is highly probable that Vyasa noticed the deviation of Arundhati around the same time Karna had noticed the deviation in the position of Mars.

- Arundhati being part of a binary, the shift has caused a dramatic appearance with reference to Vasishtha.
- In the case of Mars, there is no close companion as a reference point, and therefore the right-ward shift of Mars was less dramatized and hence escaped the attention of Mahabharata researchers

Nilesh Oak's revolutionary explanation for 'vakri' motion of Mars that he deduced for this verse from his simulator was already revealed in the 4th chapter.

3. The star Chitra is afflicted by Gara³⁹².

Karna: *citrām pīḍayate garaḥ*

चित्रां पीडयते गरहः

Many researchers interpret 'garaha' as graha and assume that a planet has afflicted the star Chitra. There is no affliction to Chitra as per the simulated chart. Gara is a Karana, the 5th

³⁹² Mahabharata: 5-141-9

anga of Panchanga. An analysis of Gara in Chitra shows that Amawasya had occurred on the 13th tithi as Vyasa expressed to Dhritarashtra.

There are **11 Karanas** and they are aligned with Tithi. To understand this we must know what a tithi means. A tithi is the gap between the sun and the moon as they move across the sky. In scientific terms it is the difference between the celestial longitudes of the sun and the moon calculated on a day to day basis. When the difference is zero it is Amawasya. When the moon completes one round around the earth and joins the sun, it is said to have travelled 360 degrees. This duration is divided into 30 parts, and each part called a **tithi**. The duration of a tithi is 12° (360 / 30 = 12). It is numbered as first, second and so on until the moon reaches the 180th degree from the sun. That is the 15th tithi, also known as Pournami.

Half of a tithi is a Karana of 6° span. Each day has two karanas spanning across one tithi.

Karana is proof of meticulous tracking of the movement of the sun and the moon for 6° extent of the sky. The Tithi- karana alignment is a constant and cannot change. A regular visual observer will be able to tell the tithi almost correctly by looking at the moon's shape in the waxing phase and the waning phase. From that shape, a regular observer will be able to gauge the corresponding karana also.

In his conversation with Krishna, Karna refers to a change in the karana! This is noticed in the 2nd half of the waning phase. Karna's anguish that something went wrong is reflected in his reference to Gara karana coinciding with Chitra.

Let me show the normal alignment of the tithi- karana for the stars if Amawasya was expected to occur in Jyeshtha.

Star	Tithi	1st Karana	2nd Karana
Pushya	Pancami	Kaulava	Taitila
Aslesha	Shashti	Gara	Vanija
Magha	Saptami	Bhadra	Bava
P.Phalguni	Ashtami	Balava	Kaulava
U.Phalguni	Navami	Taitila	Gara
Hasta	Dasami	Vanija	Bhadra
Chitra	Ekadasi	Bava	Balava
Swati	Dwadasi	Kaulava	Taitila
Vishaka	Trayodasi	Gara	Vanija
Anuradha	Chaturdasi	Bhadra	Sakuni
Jyeshtha	Amavasya	Chatushpad	Nagava

In the above table the tithi is at sunrise but could be followed by the next tithi soon after. On Pushya day Shashti started by noon as per simulation. On the day of Uttara Phalguni when the conversation took place, Gara karana was present.

But Karna reports (expecting) Gara karana a day after, i.e. in Chitra! This can happen if Gara-Trayodasi combination occurs one day early. That realignment would appear as follows:

Chitra	Ekadasi	Gara	Vanija
Swati	Dwadasi	Bhadra	Sakuni
Vishaka	Trayodasi	Chatushpad	Nagava
	Amawasya		

If Gara appears in Chitra, Amawasya will occur on the 13th tithi, in Visakha or Visakha-Anuradha junction and not in Jyeshtha!

This is **IN CONCURRENCE WITH THE 13TH TITHI (TRAYODASI) AMAWASYA** mentioned by Vyasa³⁹³.

*caturdaśīm pañcadaśīm bhūtapūrvām ca śoḍaśīm
imām tu nābhijānāmi amāvāsyām trayodaśīm
candrasūryāv ubhau grastāv ekamāse trayodaśīm
aparvaṇi grahāv etau prajāḥ saṃkṣapayīṣyataḥ*

The 13th tithi Amawasya can never happen unless the circumference of the moon's orbit had changed from the original.

As per the current knowledge, the moon is 252,088 miles away from us at the farthest distance and 225,623 miles when it is at the closest. The average orbital distance is 238,855 miles. At the average distance 30 phases occur that correspond to 30 tithis (15 in waxing and 15 in waning phase).

The duration of a phase at average distance = $238,855 / 30 = 7961.8$ miles

Now let us find out the range between the closest and farthest.

$252088 - 238855 = 13233$ miles.

This divided by $7961.8 = 1.66$

This means that between the closest and the farthest orbit of the moon, the phases can vary within 2 phases (1.66) only.

At the farthest it is $15 + 1$

³⁹³ Mahabharata: 6-3-28, 29

At the closest it is 15-1 (14th tithi)

That is why never it is stated in any text of astrology that Amawasya (no-moon) or Pournami (full moon) can happen on the 13th tithi. IF THE 13TH TITHI LUNATION OCCURS THAT MEANS THE MOON HAS COME CLOSER TO THE EARTH, BY A REDUCTION IN ITS ORBITAL CIRCUMFERENCE BY 6000 + MILES. This drift can happen over millions of years but not in a day and within a phase or two, i.e. within a month.

It occurred in the **lunar Kartika month** soon after the unusual natural events on the Pushya day that suggest a comet or asteroid hit! Only if an asteroid or a comet had hit the moon's surface also, a change could have happened in the speed of the moon, thereby causing a change in its path. This may sound unprecedented, but Mahabharata is explicit in the description of the events as indicative of a terrible asteroid hit on the earth which had not spared the moon as well. *The moon was disturbed in its orbit*, moved towards the earth by which it went through two 13 tithi phases before it regained its original orbit.

The normal nakshatra – tithi- karana alignment is shown in the left in the figure below. The right side table shows the changed alignment since Pushya day.

Star	Tithi	1st Karana	2nd Karana	Changed Tithi-Karana			
Pushya	Panca/Shash	Kaulava	Taitila	Pushya	Saptami	Bhadra	Bava
Aslesha	Shashti	Gara	Vanija	Aslesha	Ashtami	Balava	Kaulava
Magha	Saptami	Bhadra	Bava	Magha	Navami	Taitila	Gara
P.Phalguni	Ashtami	Balava	Kaulava	P.Phalguni	Dasami	Vanija	Bhadra
U.Phalguni	Navami	Taitila	Gara	U.Phalguni	Ekadasi	Bava	Balava
Hasta	Dasami	Vanija	Bhadra	Hasta	Dwadasi	Kaulava	Taitila
Chitra	Ekadasi	Bava	Balava	Chitra	Trayodasi	Gara	Vanija
Swati	Dwadasi	Kaulava	Taitila	Swati	Chaturdasi	Bhadra	Sakuni
Vishaka	Trayodasi	Gara	Vanija	Vishaka	Amavasya	Chatushpa	Nagava
Anuradha	Chaturdasi	Bhadra	Sakuni				
Jyeshtha	Amavasya	Chatushpad	Nagava				

After the asteroid-hit, the running Shashti tithi on Pushya day changed into Saptamī.

Nilesh Oak does not try to figure out how a 13-day phase can happen. He takes an easier route of declaring 13 day gap between two eclipses!³⁹⁴

4. The sign on Moon's disc had changed.³⁹⁵

Karna: *somasya lakṣma vyāvṛttaṃ*

³⁹⁴“When Did The Mahabharata War Happen?” Page 101

³⁹⁵Mahabharata: 5-141-10

Ganguli translates this as “The spot on the lunar disc hath changed its position”. The same verse appears in Vyasa’s narration following the reference to Saturn afflicting Rohini.

Vyasa: *vyāvṛttaṃ lakṣma somasya* (6-2-32)

Ganguli translates this as “The sign of the deer in the Moon hath deviated from its usual position.”

Word for word translation:

vyāvṛttaṃ = to be distinguished, to become separated, to diverge from, to divide, to part with, to wind in different directions.

lakṣma = a mark, sign, stain, bad mark, blemish (neuter nominative, accusative, vocative, singular stem: lakṣman)

somasya = of the moon (masculine genitive singular stem: soma)

Meaning:

The mark (sign) of the moon became separated or parted with.

There is no way to say that this refers to a lunar eclipse. Nilesh Oak points out in his book that Vartak has taken both observations as referring to lunar eclipse,³⁹⁶ though he himself could not agree with Vartak owing to the fact his Simulator Nyaya did not concur with Vartak’s notions.³⁹⁷

Scientifically speaking, atmospheric turbulence can make lunar surface appear to shimmer in naked eye observation under extreme conditions as experienced at that time. The poke marks on lunar surface could have appeared blinking or shaky. Now after having established that the moon had received a massive hit or a series of hits from a breaking comet or asteroid, the probability exists for **VISIBLE CHANGES IN THE SPOTS**, perhaps a new spot or sign appeared in the blank region giving an appearance that a pre-existing sign got separated and moved to a new location.

As per current scientific knowledge the *lunar surface receives on an average 140 new craters every year* and this includes only those that are more than 10 metre across.³⁹⁸ The object that shook the moon on Pushya day must have been huge enough to have caused a deep and wide penetration on the lunar surface sending plumes of lunar dust settling down on a wider region

³⁹⁶ “When Did The Mahabharata War Happen?” Page 168

³⁹⁷ Ibid. Pages 99 -100

³⁹⁸ <https://www.space.com/43075-blood-moon-2019-meteor-impact-video.html>

around the impact area. Since the object doesn't burn in atmosphere-less moon, the impact zone remains true to the size of the hitting object with the displaced lunar mud and dust settled around. It must have been huge enough to be detected by a regular visual observer of the moon.

More than half moon was originally visible in Krishna Shashti / Saptamī on Pushya day. The waning moon appears like a huge walnut compared to the smaller visible surface of waxing moon of the same tithi. It is possible for the observers on the earth (Karna and Vyasa) to have noticed a change in the marks on the moon in the initial few days after the asteroid hit. Thereafter the spilled lunar sand would have settled down well, leaving no big change for the visual observer to detect. Moreover the Moon was waning and it was not possible to track the change visually on all days after that.

5. Rahu moved towards the Sun.³⁹⁹

Karna: *rāhur arkam upeṣyati*

In **Ganguli's** translation, “*Rahu* also approacheth towards the sun.”

Most researchers have interpreted this as an eclipse. This was not possible as the Sun was far away from the nodes to be part of an eclipse.

Let us first examine how Karna was able to make the observation about Rahu which has no physical existence. Rahu and Ketu are points of intersection of the sun's path (ecliptic) and the moon's path. The path of the moon is slightly inclined from the ecliptic by 5 degrees by which one half of the lunar orbit lies above the ecliptic (north of the ecliptic) and the other half is below the ecliptic (south of the ecliptic). The intersection points keep moving backward from geo-centric perception. The point that keeps moving up (ascending) is Rahu and the other point of intersection from which the orbit is moving southward is known as Ketu. (Figure 43) When the sun and the moon meet one of the points, solar eclipse occurs, when they oppose each other near these points, lunar eclipse occurs. So the location of Rahu and Ketu is vital for deducing an eclipse.

³⁹⁹Mahabharata: 5-141-10

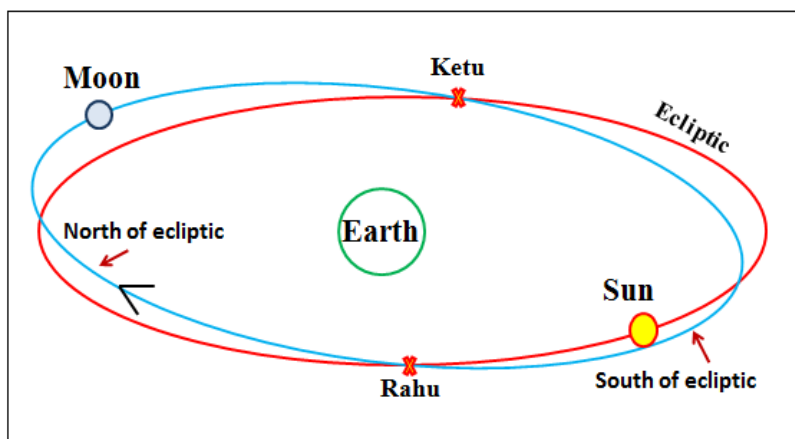


Figure 43: Location of Rahu and Ketu

A visual observer can judge whether the moon had crossed Rahu or Ketu by watching its position in the ecliptic (north or south) in successive days. Karna said that Rahu moved towards the sun. The sun was in Kartika month (Libra or Scorpio) at the time of this dialogue. In normal course, Rahu which moves anti-clockwise would anyway move towards the sun if it is present beyond Scorpio, say, in Sagittarius, Capricorn and other successive signs. Karna did not refer to this normal movement obviously because it was a nimitta, and therefore a rare and an unusual occurring. So Rahu must have been in **previous signs**, moving further towards previous degrees due to its anti-clockwise movement. It moved towards the sun could only happen if the intersection point moved clockwise. (Figure 44)

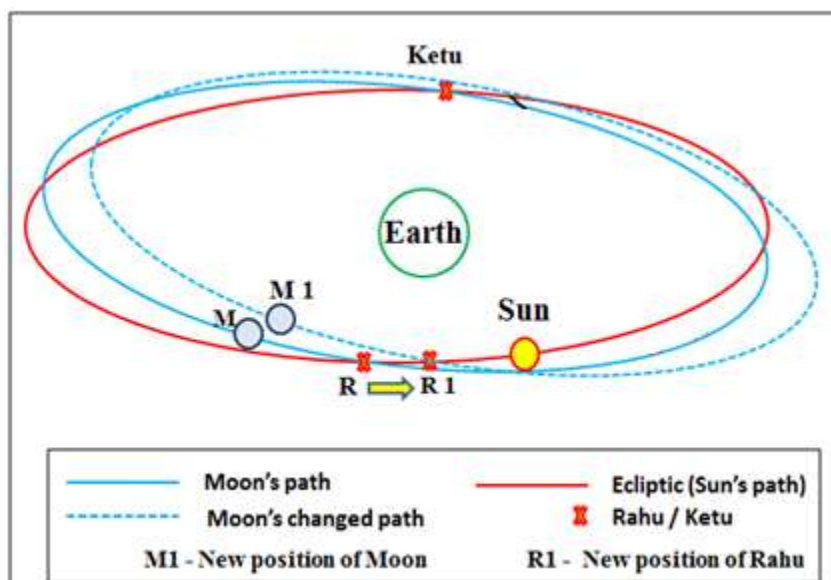


Figure 44: Rahu moving towards the Sun

In Figure 44, M is the Moon in its original path (in blue). It is moving in clockwise direction towards the sun in the ecliptic (in red). It was expected to meet the sun (Amawasya) on

Jyeshtha day. But before that (Amawasya) Rahu had moved towards the Sun, says Karna, which means R had shifted to R1 (clockwise). This can happen only if the moon shifted from M to M1 into a newer orbit (in dotted blue).

This observation was made on **Uttara Phalguni**, by which it is known **THAT THE SHIFT OF RAHU HAPPENED BEFORE UTTARA PHALGUN**. How did Karna make that observation? Only if the moon was seen to have shifted to the south of the ecliptic, this observation could be made. By saying that Rahu moved towards the sun, the moon shifted to the south a little later than the expected date when it should have shifted (R to R1 in Figure 44). Since the shift had already happened before Uttara Phalguni, it is evident the location of Rahu was before Uttara Phalguni, i.e., in anywhere between Pushya and Purva Phalguni.

In view of the fact that Rahu was before Uttara Phalguni and Amawasya was expected on Jyeshtha – six stars away, i.e. 80 degrees away, **A SOLAR ECLIPSE IN JYESHTHA IS RULED OUT**. The early Amawasya in Trayodasi tithi is understood from Figure 19, as the moon could reach the sun earlier than expected in its new orbit.

Vyasa repeated the same observation.⁴⁰⁰

Vyasa: arkam rāhustathāgrasat

Ganguli translates this in the same way as he did for Karna's reference. Karna, Vyasa and others who had been watching the surroundings keenly more than ever before, in the wake of the calamity, must have noticed the moon slipping to the south later than expected, but in view of the long distance between the sun and Rahu, a solar eclipse did not happen.

Nilesh Oak does not give any explanation for this.⁴⁰¹ How can he, for an entity that he cannot locate in his Voyager Simulator?

Now having proved that all the five planetary nimittas given by Karna referred to the asteroid-hit experienced on the day of Pushya, let me list down the nimittas given by Vyasa that concur with the asteroid hit.

Planetary nimittas seen by Vyasa at the time of asteroid-hit.

1. Shyama graha in Jyeshtha.

Shyama is the name for Venus that I already highlighted in the 4th chapter citing Brihat Jataka verse. Venus was in Jyeshtha at the time of asteroid-hit.

⁴⁰⁰Mahabharata: 6-3-11

⁴⁰¹“When Did The Mahabharata War Happen?” Page 170

Vyasa says,⁴⁰²

*śyāmo grahaḥ prajvalitaḥ sa dhūmaḥ saha pāvakaḥ
aindraṃ tejasvi nakṣatraṃ jyeṣṭhām ākramya tiṣṭhati*

The position of Venus mentioned by Vyasa as a nimitta does concur with the asteroid-hit time.

Nilesh Oak could not find any planet near Jyeshtha in Voyager for his date of Mahabharata War and left it as ‘unresolved’.⁴⁰³ Even if he checks for the traditional date of Mahabharata war, his simulator would not show the true position of Venus or any other planet for the simple reason that no astronomy simulator is designed to incorporate the true value of precession (ayanamsa) supported by the verse of Surya Siddhanta.

Lack of knowledge of alternate terms for the planets and *dependence on simulator for deducing anything and everything* are the bane of Nilesh Oak’s research.

2. Vyasa’s Pole star nimitta.

Vyasa has reported the change in the position of the Pole star after locating the Shyama graha in Jyeshtha.⁴⁰⁴ The deviation in the Pole star must have been noticed on the night of the asteroid hit or closely after the asteroid-hit.

3. Parusha planet pointing at middle of Citra and Swati.

In the very same verse on Pole star changing position, Vyasa says that a Parusho graha pointed amidst Citra and Swati.⁴⁰⁵

citrā svāty antare caiva dhiṣṭhitaḥ paruṣo grahaḥ

No astrology text refers to a word Parusha for a planet, but appearance of “Parusha” is attributed to Saturn.⁴⁰⁶ This verse is purely an astrological statement. In the simulated chart for asteroid-hit time, one can see Saturn in Capricorn. From there it is pointing (दृष्टि) to the region between Citra and Swati by its 10th aspect. Citra ends at 6-40 degrees in Libra after which Swati starts. Since Saturn’s orb starts from 9 degrees⁴⁰⁷ earlier, its 10th aspect starts from 13th to 14th degree of Libra. At this distance Citra ends and Swati begins. This Dhrishti is a corroborative piece of evidence to locate Saturn in support of the direct affliction to the

⁴⁰²Mahabharata: 6-3-15

⁴⁰³“When Did The Mahabharata War Happen?” page 92-93

⁴⁰⁴Mahabharata: 6-3-16 <http://www.sacred-texts.com/hin/mbs/mbs06003.htm>

⁴⁰⁵Ibid.

⁴⁰⁶Brihat Jataka: 2-11 Saturn is ‘Parusha romaka’ planet – having rough hairs

⁴⁰⁷Dr.B.V. Raman, “Varshaphal”, p.16.

moon (Prajapati's star-planet) told earlier. The specific reference to Citra is because the full moon in Citra is considered as the parasol of the royals.⁴⁰⁸

Nilesh Oak thinks that Parusha graha refers to Mars and deciphers 'retrogression' of Mars between these two stars seven months before his Mahabharata date.⁴⁰⁹

4. Two coppery red- topped planets at the time of rise of Saptarishi Mandala.⁴¹⁰

*grahau tāmraṇa śikhau prajvalantāv iva sthitau
saptarṣṇām udārāṇām samavacchādyā vai prabhām*

The red-top was already discussed. This must have been noticed immediately after the asteroid-hit. The obscure appearance of Saptarishi Mandala in the north and the red topped planets (Venus and Mars) in the west suggest the initial atmospheric disturbance in North and Western directions.

The probable location of the fall of the asteroid could be somewhere towards the North Western direction from India.

The moon also coming in the trajectory of the comet or asteroid, and its original phase being waning Shashti (crossed 72°), the direct hit on the moon and the earth could have impacted the region anywhere between 10°E to 30°E in Europe during the day in that impact location.⁴¹¹ It was sunset time at Hastinapur.

Vyasa, Karna and others had kept a watch on the sky and surroundings on hearing and seeing the abnormal occurrences that they called as nimittas. As night progressed, the waning moon started rising with visible changes in the marks on its surface. All these observations expressed by Vyasa and Karna were not for record purposes, as Nilesh Oak claims, but for exchanging their anxiety over the unusual occurrences.

⁴⁰⁸ Pura Nauru: verse 60 (Tamil Sangam literature) As per the sub-division of "Kudai Mangalam" in Tolkappiyam, the full moon in Citra is designated as the Royal Umbrella that symbolises protection to the subjects similar to how the Full moon protects the world from heat by absorbing the light rays of the sun and spreading only cool light to the earth.

⁴⁰⁹ "When Did The Mahabharata War Happen?" p. 91.

⁴¹⁰ Mahabharata: 6-3- 24 <http://www.sacred-texts.com/hin/mbs/mbs06003.htm>

⁴¹¹ Krishna Shashti moon appears in the horizon just before midnight at Hastinapur. It is 72° (6 x 12 where 12= 1 tithi) away from Hastinapur in the west where it was day and it was sunset at Hastinapur. The moon appeared at Hastinapur 5 to 6 hours after it rose up at that distance in the west. I have rounded off the time as 6 hours (that is when Krishna saptami appears) which is 45° on the globe. Deducting 45° from the latitude of Hastinapur (78° E) we get 33° E. The maximum eastern limit being 33° E, I gave a range of 10°E to 30° E from the Greenwich latitude.

5. Arundhati had kept her husband at her Prishṭha.⁴¹²

The A-V observation appears in a context amidst crucial verses describing the moments after the asteroid hit. This observation is preceded by the reference to the shower of blood and ashes and followed by the affliction of Saturn caused to Rohini (explained earlier at the time of asteroid-hit) and then the change in the signs on the face of the moon. This is immediately followed by the expression suggesting the asteroid-fall that a terrible roar was heard in the sky even though the sky was cloudless. AROUND THIS TIME ARUNDHATI WAS SEEN SHIFTING HER POSITION IN SUCH A WAY THAT VASISHTHA APPEARED AT HER PRISHṬHA!

The visibility of these two stars conflicts with another verse⁴¹³ on obscure appearance of the Saptarishi Mandala in the same context. A combined reading suggests that the A-V observation occurred immediately after the asteroid-hit and was followed by dimmed atmospheric appearance soon after that. The red-top appearance of the two planets is in support of this view as the two planets (Venus and Mars) were in the western sky closely following the Sun at sunset.

Vyasa's nimittas in support of reversal of atmospheric density.

The above mentioned nimittas were noticed at the time of asteroid-hit – some of them becoming possible only in ionised environment. However the impact of the hit persists in various other ways for days afterwards. They reveal reversal of atmospheric density from normal though not negative. Such nimittas are listed here.

1. At sun-rise flights of insects, by hundreds seen.⁴¹⁴

aruṇodayeṣu dṛśyante śataśaḥ śalabha vrajāḥ

According to a research,⁴¹⁵ **thermal convection** is one of the main factors for the appearance of insects flying in large numbers. There are night-time insects and day time insects, and the day time insects start flying when the temperature rises. Normally the day time insects would fly since morning in summer and in other seasons would start flying late due to lack of heating felt on the surface. *The sight of insects flying at sunrise is normal in summer but a nimitta in winter or before winter.* That Vyasa has mentioned this as a nimitta shows that the land was feeling the heat unusually at sunrise. The rising temperature raises the air, and gives a lift to the insects.

⁴¹²Mahabharata: 6-2- 31 <http://www.sacred-texts.com/hin/mbs/mbs06002.htm>

⁴¹³Mahabharata: 6-3-24 <http://www.sacred-texts.com/hin/mbs/mbs06003.htm>

⁴¹⁴Mahabharata: 6-2-29 <http://www.sacred-texts.com/hin/mbs/mbs06002.htm>

⁴¹⁵Technical Bulletin, Issues 651-675, United States Department of Agriculture, 1940. Pages 115 to 129

2. At both twilights, the cardinal quarters seemed ablaze.⁴¹⁶

ubhe saṃdhye prakāśete diśāṃ dāhasamanvite

Feeling the heat at day time is normal, but twilights were hot and looked like burning. This is indicative of turbulence characterised by motion of convective currents leading to chaotic changes in the atmosphere.

3. There was shower of blood and ash.⁴¹⁷

āsīd rudhiravarṣaṃ ca asthi varṣaṃ ca

Though I discussed this earlier, let me give more details. The shower of flesh is reported often around the world and has been scientifically accounted for. Hastinapur and surrounding regions must have been experiencing tornado like whirlwinds for some time picking up animal life and pouring them down as showers.

The blood red shower can be understood as *shower of red-muddied water brought by whirlwinds*. In **Balarama's Tirtha Yatra** comes an episode of river Saraswati turning into blood at Vasishthapravaha⁴¹⁸ - a reference to red-muddied water. This changed into normal appearance after a year. The red-coloured water from River Saraswati or elsewhere must have been brought down as showers by the whirlwinds. The same event mentioned thrice in the same period establishes heavy disturbances in the atmosphere indicative of increasing particulate density in the atmosphere. Reference to ash in Vyasa's narration adds another dimension to calamity caused by volcanic activity or fire elsewhere.

4. Frequent earthquakes and tectonic disturbances.

A terrible asteroid hit is likely to cause a chain reaction of tectonic disturbances. They could continue for some time after the asteroid hit.

- Even though the sky is cloudless, a terrible roar is heard⁴¹⁹
- The earth is frequently trembling⁴²⁰
- 'From the mountains of Kailasa and Mandara and Himavat thousands of explosions are heard and thousands of summits are tumbling down'⁴²¹

kailāsamandarābhyāṃ tu tathā himavato gireḥ

sahasraśo mahāśabdaṃ śikharāṇi patanti ca

⁴¹⁶Mahabharata: 6-2-30

⁴¹⁷Mahabharata: 6-2- 30

⁴¹⁸ Mahabharata: 9-40 <http://ancientvoice.wikidot.com/src-mbh-09:section-40>

⁴¹⁹Mahabharata: 6-2-33

⁴²⁰Mahabharata: 6-3-11

⁴²¹Mahabharata: 6-3-35

This is a clear case for tectonic compression of the Himalayan fault lines triggering a series of tremors in many regions of north India.

5. Tsunamis reported.

Vyasa continues, ‘In consequence of the Earth's trembling, each of the four oceans having swelled greatly, seems ready to transgress its continents for afflicting the Earth’⁴²²

*mahābhūtā bhūmikampe caturaḥ sāgarān pṛthak
velām udvartayanti sma kṣobhayantaḥ punaḥ punaḥ*

6. The tectonic movement has caused the river to change direction.

Vyasa says, ‘The great rivers are flowing in opposite directions. The waters of rivers have become bloody.’⁴²³

pratisroto 'vahan nadyaḥ saritaḥ śoṇitodakāḥ

7. Release of rare gases from the surface fissures.

The sacrificial fire, when Brahmanas pour libations on it, becomes blue, or red, or yellow. Its flames bend towards the left, yielding a bad scent, accompanied by loud reports.⁴²⁴

*pītalohita nīlāś ca jvalaty agnir huto dvijaiḥ
vāmārciḥ śāvagandhī ca dhūmaprāyaḥ kharasvanaḥ*

The colour of the fire depends of the offerings done. The specific reference to the different colours of the Homa fire shows that such colours and smell are unusual. Such differences can be attributed to different gases in the air that are normally not present. The tectonic fissures are known to release some gases trapped underneath. This nimitta is indicative of change in the atmospheric composition.

8. Strange coloured halos around the Sun.

Vyasa makes a significant reference to ‘Parigha’ surrounding the sun in colours that are strange and therefore ominous of a calamity. Though already discussed, here I wish to highlight the causes for the tri-coloured Parigha (halo) around the sun with a black neck around it appearing in both twilights.⁴²⁵

Scientifically such an appearance tells about presence of unusual chemicals and gases in the sky which could have come from **massive explosions** of outpouring lava or meteor / asteroid

⁴²² Mahabharata: 6-3-36

⁴²³ Mahabharata: 6-3-32

⁴²⁴ Mahabharata: 6-3-38

⁴²⁵ Mahabharata: 6-2-21

hits. Brihat Samhita gives details of both auspicious and inauspicious Parigha halo around the sun.⁴²⁶

9. Two 13-day phases (Paksha) of the Moon.

The most intriguing and ominous indicator of a calamity in outer space is made out from Vyasa's verse on 13 day lunar phase that was already discussed in the context of Gara karana.⁴²⁷

The 13 -day lunar phase is mentioned again 35 years later at the time of Krishna's exit.⁴²⁸ This has been interpreted by many researchers as **referring to 13 day eclipse**. The verse doesn't say so. It only says that having seen the calamities at the time of the 13th day Amawasya, Krishna told himself that the 14th tithi made the 15th by Rahu at the time of Bharata war had come back again for destruction. This verse clearly makes out a distinction between 13-day Amawasya and a regular eclipse that took place while the war was on.

The 13-day phase occurred twice continuously. Many astrological texts have come up long after Mahabharata, but at no time the reduction of tithis to this extent was reported. This aberration has been recorded only twice in the past, at the time of Krishna's peace mission. This unusual phenomenon can have only one interpretation, and it was discussed extensively earlier. **MOON MUST HAVE SUFFERED A MASSIVE ASTEROID OR COMET HIT THAT COULD HAVE CAUSED A CHANGE IN ITS WOBBLE, RESULTING IN TWO CONSECUTIVE SHORTENED PHASES. THE** Moon had regained its original state within a month. The Moon has a proven history of having attained the current angle of tilt caused by bombardment of asteroids.⁴²⁹

Similar kind of change in the wobble of earth and a change in the **angle of tilt of the earth** was noticed in 2011 caused by the Tohoku earthquake in Japan.⁴³⁰ Similar kind of asteroid hit was detected near Madagascar causing 600 feet high tsunami⁴³¹ around the time of submergence of Dwaraka soon after the exit of Krishna, but the loss of two tithis was only once recorded in history, as explained above.

⁴²⁶Brihat Samhita: chapters 30-25 & 47 -23

⁴²⁷ Mahabharata: 6-3-28 & 29

⁴²⁸Mahabharata: 16-3- 16 & 17

⁴²⁹ Mystery of the Moon's tilted orbit. <https://earthsky.org/space/why-is-the-moons-orbit-tilted-collisionless-encounters>

⁴³⁰Japan Quake May Have Shortened Earth Days, Moved Axis
<https://www.nasa.gov/topics/earth/features/japanquake/earth20110314.html>

⁴³¹ 'Did a Comet cause the Great Flood?' <http://discovermagazine.com/2007/nov/did-a-comet-cause-the-great-flood#.UT23fVfsgZI>

10. Temporary phenomenon of Arundhati 'walking ahead' of Vasishtha.

In the backdrop of the scientifically explained nimittas listed above, a strong case exists for the reversal of the atmospheric density caused by unusual natural calamities from outer space and from within the earth's interior. The thermal convection released by tectonic explosions in north India had created hot conditions near the surface causing less density of air at the ground level. At the same time the upper layer of air was loaded with particles released by asteroid hits elsewhere. Heavy turbulence in the air is also detected from the description of shower of flesh witnessed over a period of time. The rarer to denser conditions found normally from upper to lower atmosphere had changed to denser to rarer conditions causing unusual appearances of sorts that have been recorded as nimittas by Vyasa.

Of these, *3 stars and 3 planets appeared in impossible ways at the time of or as soon as the asteroid hit the earth causing ionisation conditions.*

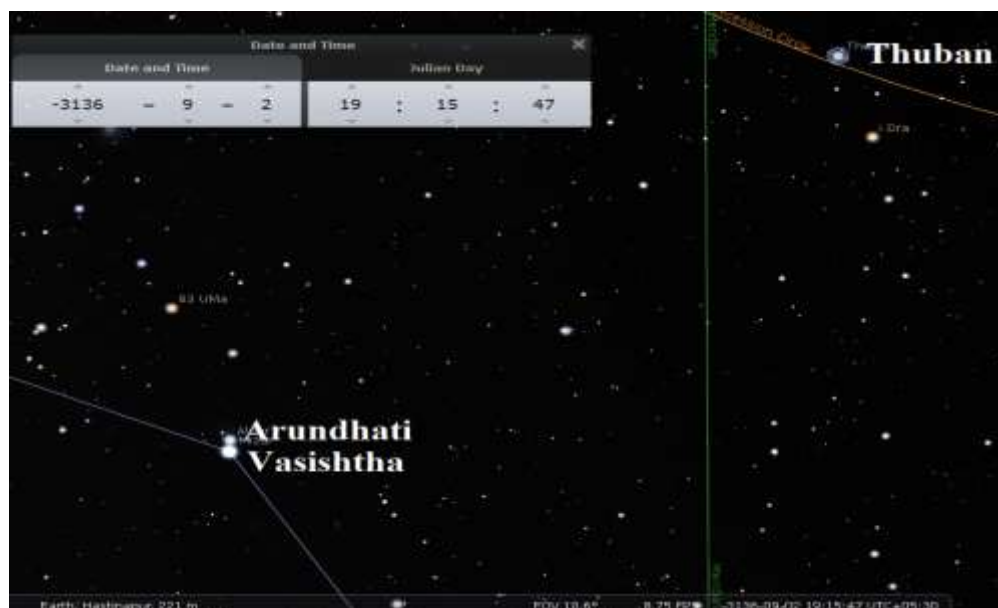
- Venus and Mars appeared with coppery-red crest.
- Mars made a reverse movement towards Anuradha.
- The pole star (Dhruva) appeared in apasavyam way.
- Arundhati appeared in such a way that Vasishtha was at her prishṭha.

The appearance of the Sapta Rishi Mandala soon after sunset on the date⁴³² of asteroid-hit is taken out from Stellarium and shown below. The date is as per Julian calendar and does not correspond to the same date of the astrology software for the Panchanga features I have derived. However the difference may not be substantial.



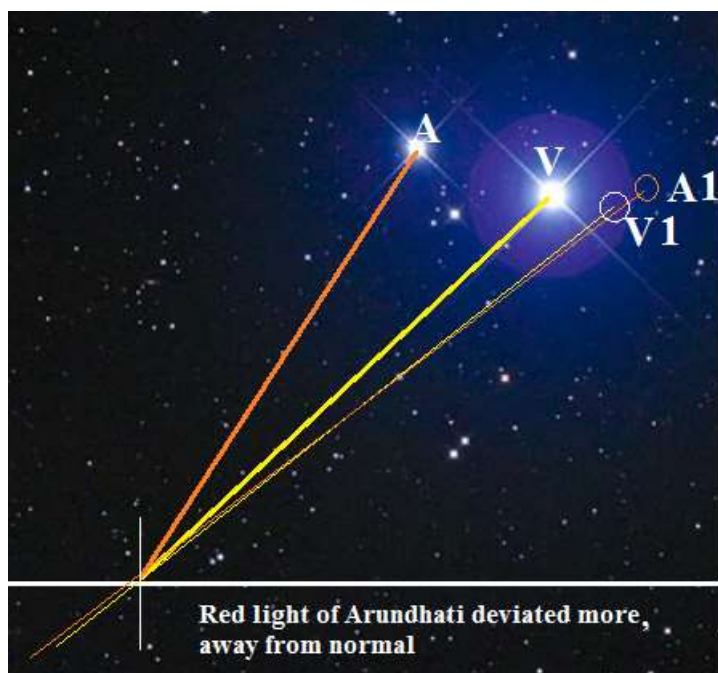
⁴³² This is Julian date and not corrected to Gregorian date of the astrology software.

Close-up view is provided below to see the positional alignment of Arundhati with reference to Vasishtha. The ‘apasavyam’ movement of the pole star gives us the lead on how Vyasa could have seen the apparent position of Thuban and Arundhati.



In the above simulation, Arundhati appears above Vasishtha, which is actually behind position for Arundhati. After the calamity, the two stars had deviated from their actual positions (the above alignment) due to refraction. One reason was the hypothetical negative refractive index of the distant atmospheric layers; another was the difference in wave lengths of the light from the two stars. Vasishtha is blue coloured star and Arundhati leaves out red light when her reddish binary crosses in front of her.

The phenomenon of coppery red top of the two planets is a pointer to what probably happened with the A-V stars. *Greater deflection of red light away from normal was the cause for the red-top of the planets.* Similar kind of deflection would make the A-V pair appear as follows:



The picture is hypothetical and for illustrative purpose only to highlight a probable scenario, taking into account the **red light of Arundhati** and the greater deflection of red light away from normal that caused the planets appear with red colour on top. In this figure *both Vasishtha and Arundhati had shifted to the right* (to V1 and A1), but **ARUNDHATI HAD SHIFTED MORE DUE TO HIGHER DEFLECTION OF THE LONGER WAVE LENGTH OF THE RED RAYS** of her spectroscopic binary. I positioned her on top of Vasishtha in tune with the observation of Vyasa of red-crest of the two planets at the same time. The final appearance was as though Vasishtha had gone behind Arundhati. In reality Arundhati could have appeared differently from this (above figure) but the basic cause was a change in the refractive index, different from the standard number.

Similarly Thuban had appeared a little below its original position, as though it has moved clockwise. The changed appearance of these stars could have lasted for a few minutes only, as the atmosphere started getting dense making the Saptarishi Mandala look obscure.

Whatever was sighted was sighted by Vyasa alone and none else.

This A-V re-alignment was not reported any time before or after that particular moment of the day of asteroid hit. Vyasa has rightly observed it as a nimitta.

THE A-V OBSERVATION WAS NOT AN ASTRONOMY EVENT BUT A SCIENTIFIC EVENT SYSTEMATICALLY DERIVED THROUGH LOGICAL AND SCIENTIFIC REASONING OF THE EVENTS REPORTED BY VYASA. Nilesch Nilkanth Oak has erroneously interpreted it as an astronomy event and set a time limit for Mahabharata and Ramayana based on it. With absolutely no

idea about the kind of ‘scientific acumen’ he has demonstrated by this, he is seen going around chest trumpeting his ‘great discovery’. A leaf out of his blog written as recently as in April 2019⁴³³ is reproduced below.

One can not say that AV observation and its implications were well known because it can be shown that no other Mahabharata researcher could reveal its objective testability until Nilesh Oak showed it in May 2009.

That AV observation was not seen as objectively testable observation previously is proved by state of the art about AV observation as of 2009.

One can not say that somehow folks knew all about AV observation and only Nilesh Oak did not know it.

Hence AV observation as a revolutionary objectively testable observation is an effect that was not known but was discovered in 2009.

With Nilesh Oak’s ‘Epoch’ in shambles now, let me recall his opening words in the chapter on the Epoch of Arundhati.

“If ‘Arundhati’ does not qualify as the most unambiguous astronomical evidence in determining the date of Mahabharata War, let’s stop talking about astronomical evidence in Mahabharata.”⁴³⁴

Arundhati is not an astronomical evidence to draw a time line to fix Mahabharata into it. Let Nilesh Nilkanth Oak, true to his words above, stop talking about astronomical evidence from now onwards or at least after reading the 14th chapter of this book on the absurdities of his explanations for almost all the astronomical evidences he had chosen to interpret. For now, let me move on to deciphering the time of Mahabharata war through internal evidences.

⁴³³ “कार्यसम (Balancing the Effect)”

<https://nileshoak.wordpress.com/2019/04/19/%e0%a4%95%e0%a4%be%e0%a4%b0%e0%a5%8d%e0%a4%af%e0%a5%8d%e0%a4%af-%e0%a4%b8%e0%a4%ae-balancing-the-effect/>

⁴³⁴ “When Did The Mahabharata War Happen?” page 53

Chapter 12

DATE OF MAHABHARATA FROM INTERNAL EVIDENCES

Mahabharata gives a wealth of information on every conceivable and non-conceivable aspect of animate and inanimate things found around. The analysis in the previous chapter is proof of one such non-conceivable celestial event that can be validated with the aid of modern science. Shouldn't then we expect that the time of Mahabharata must also be lying hidden, away from direct perception? Let me journey through the inputs of Mahabharata to unravel this mystery.

Calendar is the basis for time computing. We have to first decipher the calendar used by the people of the Mahabharata period. Nilesch Oak has given a vague idea of the various features of the Mahabharata calendar without deducing the basics.⁴³⁵ Mahabharata does give a decipherable calendar that was in vogue at that time. Once we are able to decode it, many inputs on time mentioned here and there in Mahabharata do fall in place.

Earlier in the 10th chapter I established that Mahabharata war occurred in the year “Krodhi”, 35 years before the start of Kali Maha Yuga in the year “Pramathi”. In the same year the Pandavas must have completed their exile. All the planetary sightings, permanent and temporary (nimittas) by Vyasa, Karna and Drona were done only in this year. This year is like a canvas on which we have to trace the happenings.

Identifying the calendar of the Mahabharata period.

The Pandavas were expected to complete **13 years in exile**. But a few days before that period ended, their identity became known. The gap is only a few days and not more, is known from two verses, one by **Karna** and another by **Draupadi**.

The near completion of the exile period was conveyed by Karna, when on hearing the blare of the conch of Arjuna, as Vrihannala in the company of Uttara he stated that Vibhatsu (Arjuna) was engaged in the last eight and five years (13 years) in severe austerities to strike him in combat.⁴³⁶ The number of days left can be gauged from the reply of Draupadi to **Sudeshna, the queen of Virata** when asked by her to leave the country upon the death of

⁴³⁵“When Did The Mahabharata War Happen?” Chapter 4

⁴³⁶ Mahabharata: 4-43-6 <https://www.sacred-texts.com/hin/mbs/mbs04043.htm>

Kichaka. *Draupadi pleaded to bear with her for just thirteen days after which she would leave.*⁴³⁷

This implies that the exile period was going to get over in the next thirteen days.

Within this thirteen day period, emboldened by the absence of **Kichaka**, the **Trigartas** started attacking the Matsya country aided by the Kauravas. The Kauravas were pursued by Arjuna in the guise of Vrihannala whose identity was recognised by the Kauravas by the sound of his conch. Thinking that Arjuna was spotted by them before the end of the exile, they asked Bhishma for clarification. Bhishma's reply helps us to identify the calendar in vogue at that time.

Deciphering the extra days in exile spent by the Pandavas.

Bhishma said that there was an excess of 5 months and 12 days in the 13 years spent by Pandavas in exile.⁴³⁸ This was calculated on the basis of the 5-Year Yuga system in which for every 2 and half solar years, one lunar month gets increased. To quote the exact words of Bhishma,

"The wheel of time revolves with its divisions, viz., with Kalas and Kasthas and Muhurtas and days and fortnights and months and constellations and planets and seasons and years. In consequence of their fractional excesses and the deviations of also of the heavenly bodies, there is an increase of two months in every five years. It seems to me that calculating this wise, there would be an excess of five months and twelve nights in thirteen years. Everything, therefore, that the sons of Pandu had promised, hath been exactly fulfilled by them. Knowing this to be certain, Vibhatsu hath made his appearance." (Ganguli's translation)⁴³⁹

From Vedanga Jyothisha it is known that this is about the 5-year Yuga system in which two lunar months increase (Adhika masa) every five years. In ten years 4 months increase and in the next 3 years, 1 month and some days increase. Overall there will be an addition of 5 months and some days. The days are given as "**DVĀDAŚA CA KṢAPĀḤ**" in which kṣapāḥ is variously interpreted while the number of days are known as twelve.⁴⁴⁰

When we apply the aphorisms found in Vedanga Jyothisha for the 5-year Yuga, we are able to decode Bhishma's calculation.

No of solar days in a year = 366⁴⁴¹

In 5 years (Yuga) = 366 x 5 = 1830

⁴³⁷ Mahabharata: 4-23-27 <https://www.sacred-texts.com/hin/mbs/mbs04023.htm>

⁴³⁸ Mahabharata: 4-47-1 to 5 <https://www.sacred-texts.com/hin/mbs/mbs04047.htm>

⁴³⁹ Mahabharata: 4-52 <https://www.sacred-texts.com/hin/m04/m04052.htm>

⁴⁴⁰ Mahabharata: 4-47, verses 3-4 <http://www.sacred-texts.com/hin/mbs/mbs04047.htm>

⁴⁴¹ Y-VJ: 28 ("Vedanga Jyothisha by Lagadha" by T.S.Kuppanna Sastry)

In 13 years = $366 \times 13 = 4758$

No of lunar days in 5 years (Yuga) = $1830 + 62 = 1892$

In 13 years = 4919 days (d), 6 muhurta (m).

The lunar days had far exceeded the solar days. Subtracting the solar days from the lunar days we get the excess days spent by the Pandavas in exile.

Lunar days – Solar days = $(4919 \text{ d} + 6 \text{ m}) - 4758 \text{ d} = 161 \text{ d} + 6 \text{ m}$

Converted into months and muhurthas = $(161 \text{ d} + 6 \text{ m}) / 30 = 5 \text{ months}, 11 \text{ days}, 6 \text{ muhurthas}$

This exactly matches with Bhishma's version of extra 5 months and “*dvādaśa ca kṣapāḥ*”, referring to less than 12 days as per the above calculation. Among the many meanings of ‘Kshapa’, ‘night’ was suggested by some. With the calculation coming to more than 11 days but less than 12 days, by having only 6 Muhurtas on the 12th day, Bhishma meant the other meaning, i.e. “diminishing” for Kshapa. This establishes **THAT THE PANDAVAS SPENT AN ADDITIONAL 5 MONTHS AND LESS THAN 12 DAYS IN EXILE**. Within the last 13 days (as per Draupadi's reply to Sudeshna), Arjuna revealed his identity.

Bhishma's calculation shows it was the **5- year Yuga** in use at that time. The earliest reference to this Yuga appears in the 1st Mandala of the Rig Veda on the sage, **Dirghatamas**. It is stated that the sage grew old (or perished) in the 10th Yuga.⁴⁴² This is a reference to the 10th Yuga in his life that works out to the five year period between 45th to 50th years of his life. This sage lived before Ramayana period that is known from the existence of a country by name Anga, ruled by Romapada in Ramayana. Anga got its name from a person Anga who was fathered by Dirghatamas.⁴⁴³ This is to show that this Yuga system was in vogue in Bhartavarsha from before the Ramayana times. Decipherment of the date of both the Itihasas must comply with the rules of this Yuga system.

Let us begin to do that decipherment to know the exact years within the exile period when the five Adhika months had occurred. The sequence must be known, because of the *crucial derivation from Mahabharata that **BHISHMA**, who seemed to be an authority on calculation of time, **FAILED TO JUDGE THE ARRIVAL OF UTTARAYANA** and was forced to wait for more than a month in what seems to be a case of Adhika masa!* So our next step is to find out whether the extended stay was due to an Adhika masa at that time as a natural sequence or caused by the loss of tithis in the two 13 tithi phases, already explained in the previous chapter.

⁴⁴² Rig Veda: 1- 158 – 6 “*dirghatamā māmāteyo jujurvān daśame yughe*”.

⁴⁴³ Vishnu Purana: 4-18

Deducing the beginning of the 5-year Yuga period in Mahabharata.

In the 5-year Yuga concept, the year began on the day of Uttarayana, or the day after the sun turned north. This date is not the exact date of the sun turning to north in the computation of the 5 year Yuga. (Nilesh Oak searched for the exact northward movement in his tropical simulator and landed up at Phalguna month). It is known from Vayu Purana that no date has sanctity unless it is connected with the sun and the moon. In this context Vayu Purana refers to Mesha (Aries) and Tula (Libra) as equinox months but identifies the date of equinox only by the position of the sun and the moon in opposition to each other in specific *pada* of the star.⁴⁴⁴

The same concept is found in **Lagadha's Vedanga Jyothisha**. The basic concepts of the 5-year Yuga as deduced from Lagadha's Rig Jyothisha are (1) the first year started on the day of the **conjunction of the sun and the moon** in Magha Amawasya in Lagadha's time,⁴⁴⁵ which means the lunar Phalguna month started the next day, though the solar month continued to be Tapas (Aquarius); that was the starting day of Uttarayana (2) this conjunction **repeated** on the 6th year, i.e. after 5 years, and (3) within the 5 year period, two Adhika Masa-s occurred.

The repetition of the conjunction of the sun and the moon on the 6th year (the 1st year of the Yuga) implies that **THE SUN WAS AT ITS TRUE POSITION OF THE WINTER SOLSTICE (UTTARAYANA) ONLY IN THE 1ST YEAR.** In the other four years, the sun could not be in the true Uttarayana degree; nor was the conjunction of the sun and the moon possible in those four years at the true Uttarayana degree.

Applying these concepts to Mahabharata, it is found that Bhishma's version on the upcoming Uttarayana did not match with the first point on the conjunction of the sun and the moon. He expected Uttarayana to start on *Shukla Ashtami in the month of Magha* when the moon was in *Rohini* which could happen in any year other than the 1st year of the 5- year Yuga.

This brings us to the task of identifying the first year of the 5- year Yuga closer to **KRODHI** (the year of the war) when the sun and the moon were together in the month of Magha. On checking the combination in Jhora astrology simulator for Surya Siddhanta ayanamsa of close to zero ayanamsa of the Mahabharata times, there are twin surprises in Krodhi! (1) The Adhika masa occurred in Caitra in Krodhi. (2) And in Krodhi, the Uttarayana started at the conjunction of the Sun and the moon in the star Uttarashadha, which means **KRODHI WAS THE 1ST YEAR OF THE 5 YEAR YUGA AT THAT TIME.**

⁴⁴⁴ Vayu Purana: 1-50-195 to 198

⁴⁴⁵ Conjunction of the sun and the moon in Sravishtha (R-VJ: 5-6 and Y-VJ: 6-7)

Let us first take up the Adhika Masa in Krodhi. Figure 45 shows the Adhika Caitra in Shobhana (Shobhakrit, the year preceding Krodhi). The previous month was Adhika Masa in the year Krodhi, but the simulator recognises it with the previous year, i.e. Shobhana, as it is based on the current practice of change of the year with the arrival of Caitra. We should remember that Uttarayana marked the year beginning in the 5 year Yuga. As such, the year Krodhi started from Magha, a month before Caitra. This can be expected to be seen written as the year Shobhana in the simulator.

Body	Longitude	Nakshatra	Pada
Lagna	10 Pi 19' 32.97"	UBha	3
Sun - DK	0 Pi 50' 26.73"	PBha	4
Moon - MK	9 Pi 25' 01.54"	UBha	2
Mars - BK	9 Cn 44' 12.25"	Push	2
Mercury (R) - PiK	7 Pi 34' 14.41"	UBha	2
Jupiter - PK	6 Ar 43' 28.88"	Aswi	3
Venus - GK	5 Pi 37' 17.16"	UBha	1
Saturn - AK	23 Cp 24' 54.51"	Dhan	1
Rahu - AmK	17 Le 30' 47.46"	PPha	2
Ketu	17 Aq 30' 47.46"	Sata	4

Date:	<u>December 22, -3137</u>
Time:	7:00:00 am
Time Zone:	5:30:00 (East of GMT)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India
Lunar Yr-Mo:	Shobhana Adhika Chaitra Krodhi
Tithi:	Sukla Pratipat (Su) [Kaameswari] (28.53% left)
Vedic Weekday:	Saturday (Sa)
Nakshatra:	Uttarabhadra (Sa) (54.37% left)
Sunrise:	6:32:32 am
Sunset:	5:41:29 pm
Ayanamsa:	<u>0-31-34.68</u>

Figure 45: Adhik Masa in Caitra in the year Krodhi (3137 BCE)

The next month was Nija Caitra which the simulator recognises in the year Krodhi. (Figure 46)

Body	Longitude	Nakshatra	Pada
Lagna	12 Ar 25' 02.53"	Aswi	4
Sun - AK	29 Pi 30' 14.00"	Reva	4
Moon - GK	2 Ar 20' 10.69"	Aswi	1
Mars - MK	13 Cn 56' 56.07"	Push	4
Mercury - DK	2 Pi 04' 02.42"	PBha	4
Jupiter - PiK	13 Ar 25' 44.74"	Bhar	1
Venus - PK	11 Ar 40' 01.79"	Aswi	4
Saturn - AmK	26 Cp 10' 04.89"	Dhan	1
Rahu - BK	15 Le 58' 34.76"	PPha	1
Ketu	15 Aq 58' 34.76"	Sata	3

Date:	January 20, -3136
Time:	7:00:00 am
Time Zone:	5:30:00 (East of GMT)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India
Lunar Yr-Mo:	Krodhi - Nija Chaitra
Tithi:	Sukla Pratipat (Su) [Kaameswari] (76.40% left)
Vedic Weekday:	Sunday (Su)
Nakshatra:	Aswini (Ke) (82.48% left)
Sunrise:	6:24:21 am
Sunset:	6:24:11 pm
Ayanamsa:	0-31-30.39

Figure 46: Nija Caitra in the year Krodhi (3136 BCE)

When we trace the beginning of Uttarayana in Krodhi, the date turns out to be 24th October, 3137 BCE. Interestingly the day shows the conjunction of the sun and the moon at the exact beginning of Capricorn where the 2nd pada of Uttarashadha begins. This conjunction can happen only in the 1st year of the Yuga! (Figure 47)

Body	Longitude	Nakshatra	Pada
Lagna	11 Cp 02' 31.90"	Srav	1
Sun - DK	1 Cp 08' 58.84"	USha	2
Moon - GK	8 Cp 21' 22.15"	USha	4
Mars (R) - AmK	26 Cn 23' 11.89"	Asre	3
Mercury - MK	19 Sg 51' 53.61"	PSha	2
Jupiter - AK	26 Pi 37' 54.55"	Reva	3
Venus - BK	21 Sg 21' 20.80"	PSha	3
Saturn - PiK	16 Cp 26' 03.18"	Srav	2
Rahu - PK	20 Le 38' 19.56"	PPha	3
Ketu	20 Aq 38' 19.56"	PBha	1

Date:	October 24, -3137	Tithi:	Sukla Pratipat (Su) (39.95% left)
Time:	7:00:00 am	Vedic Weekday:	Wednesday (Me)
Time Zone:	5:30:00 (East of GMT)	Nakshatra:	Uttarashadha (Su) (12.33% left)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India	Sunrise:	6:18:23 am
Lunar Yr-Mo:	Krodhi Shukla Magha Uttarayana	Sunset:	4:23:33 pm
		Ayanamsa:	0-31-43.40

10	08			
Ju				
UL	A5		A7	A3
Ke		Natal Chart		(Ma)
A11	A10			A5
Su	As	Rasi		Ra
Sa				
Ve	Me			Ne
A3	A2	BL	BS	Ur

Figure 47: Uttarayana of Krodhi - the first year of the Yuga

The 1st year of the 5-year Yuga in Mahabharata times started on the first day of the month of Magha (Shukla Pratipat) when the sun and the moon were together in Uttarashadha. The

previous day of Amawasya in the month of Pushya was the day the conjunction started, signalling the beginning of Uttarayana. This matches exactly with the zero degree ayanamsa at that time. Only then the winter solstice could start at the junction of Sagittarius and Capricorn with the Sun just having entered Capricorn. The Pandavas returned in this year that happened to be the 1st year of the 5 year Yuga, i.e. Samvatsara year.⁴⁴⁶ The war was fought in this year.

The major revelation from this is:

The equinox was forward moving during Mahabharata times. From Magha Shukla Pratipat in Mahabharata, the Uttarayana shifted forward to Magha Amawasya in Lagadha's time. This proves that the idea of continuous 'precession' of the equinoxes is erroneous. This concurs with the derivation we made in the 5th chapter.

Constructing the Mahabharata calendar from the first year of the Yuga

The relationship between the tithi and the nakshatra of the Uttarayana day is a standard one in the 5 year Yuga, as known from Lagadha's Vedanga Jyothisha.⁴⁴⁷ There are 6 synodic months and 6 tithis in an ayana (1 Yuga = 62 synodic months = 10 ayanas). So every 7th tithi starting from the 1st year (that began in Uttarayana) would give the starting tithi of the subsequent ayanas. Similarly every 19th star starting from the star of the first day of Uttarayana in the 1st year would be the star of the first day of the subsequent ayanas.

(Contrast this with Nilesh Oak's understanding of the lunar tithi that it

*"moves by 10-11 days each year while the day of winter solstice, dated per western calendar would not move (i.e. not more than 1-2 days) over a short span of time. This means time period predicted for the Mahabharata War based on the day of winter solstice coinciding with 'Magha Shuddha Ashtami' would be a range and not a single specific year."*⁴⁴⁸

This is demonstrative of the fact that Nilesh Oak cared less to derive time scientifically either by applying the concept or by Ganita but had only handed down simulator -centric views).

Conceptually we will be able to construct the tithi- nakshatra of the first day of all the 10 ayanas in the 5 years of Mahabharata times. Let me first derive the 5-year Yuga that started on Uttarashadha of Magha in Krodhi.

⁴⁴⁶ Vayu Purana: 1-50-183. The year names starting from the first year of the 5 year Yuga are Samvatsara, Parivatsara, Idvatsara, Anuvatsara and Vatsara.

⁴⁴⁷ Rig Jyothisha 8 & 9, Yajur Jyothisha 9 & 10.

⁴⁴⁸ "When Did The Mahabharata War Happen?" Page 138.

Year No	Year Name	Uttarayana started in Magha			Dakshinayana started in Ashadha		
		Tithi	Sun star	Moon Star	Tithi	Sun Star	Moon Star
1	Samvatsara	Sh 1	U-Asha	U-Ashadha	Sh-7	Punarvasu	U-Phal
2	Parivatsara	Sh -13	U-Asha	Rohini	Kr - 4	Punarvasu	Dhanishtha
3	Idaavatsara	Kr -10	U-Asha	Swati	Sh - 1	Punarvasu	Punarvasu
4	Anuvatsara	Sh - 7	U-Asha	U-Bhadra	Sh - 13	Punarvasu	Jyeshtha
5	Idvatsara	Kr - 4	U-Asha	Magha	Kr - 10	Punarvasu	Bharani

Figure 48: Mahabharata calendar in vogue during the year Krodhi

The Yuga, the 1st year and the Uttarayana of the first year started with the conjunction of the sun and the moon in Uttarashadha. It can be seen that the Uttarayana date did not start on the same day every year, though the sun turned northward in the same star. A researcher in Mahabharata must bear in mind this anomaly in the calendar in vogue at that time. No modern simulator can detect this anomaly.

The 1st year was Krodhi, the year when the Pandavas ended their exile and the war was fought. At the end of the war, Bhishma waited for the Uttarayana, for his exit from the earth. That was the 2nd year of the Yuga, called Vishvavasu.

As per the above table, the Uttarayana must have started on Shukla Trayodasi in Magha, in the 2nd year of the Yuga when Bhishma was waiting to leave, but it started on Shukla Ashtami in Magha!

Discrepancy in the start of Uttarayana after the war.

Bhishma says, “*The lunar month of Magha has come. This is, again, the lighted fortnight and a fourth part of it ought by this according to my calculations be over*”.⁴⁴⁹

māgho 'yaṃ samanuprāpto māsaḥ puṇyo yudhiṣṭhira
tribhāgaśeṣaḥ pakṣo 'yaṃ śuklo bhavitum arhati (13-153-28)

Without any discussion on this verse, Nilesch Nilkanth Oak preferred to quote two alterations of this verse in the critical version by replacing ‘Maghoyam’ with ‘Masoyam’ and ‘Masa Punyo’ with ‘Masa Pushya’ and claimed this to be an interpolation done 2000 years ago. He

⁴⁴⁹ Mahabharata, 13-167.

has to make such claims or else he cannot substantiate his date of winter solstice that appears in Phalguna month in his simulator that traces tropical zodiac.

At the face of it, the verse refers to Magha month and three fourth of it. Three fourth of a lunar month is seven and a half tithi (after Saptamī / on Ashtami) in Krishna Paksha (waning). However by saying further “*pakṣo 'yaṁ śuklo bhavitum arhati*”, Bhishma had referred to 7 and a half tithis in Shukla Paksha of Magha (waxing Magha). Bhishma identified the month as ‘Punya Masa’ of Magha. Magha was Punya Masa because the Uttarayana started in the month of Magha. Bhishma had made it clear that Uttarayana started after the completion of Saptamī in Shukla Paksha of Magha.

A verse expressing the same idea is quoted by Nilesh Oak as an additional text from Gita Press edition (No 110 in his list of Mahabharata references) saying that Bhishma Nirvana happened on “*Magha Shuddha Ashtami and when the Moon was near Rohini*”⁴⁵⁰

Śukla pakṣasya cāṣṭamyām māgha māsasya pārthiva
prajāpatye ca nakṣatre madhyam prāpte divākare⁴⁵¹

The additional information is that the sun was at the middle of Rohini, the star of Prajapati. This means that the sunrise occurred at the middle of Rohini. This is an essential condition to identify the day Bhishma left the world, after spending his time on the arrow bed for 58 days.

Since Magha Shukla Ashtami offers a definite time limit, the general tendency of researchers is to deduct 58 days from this date to arrive at the first day of the war. It more or less comes to the last day of Kartika month - the month in which Krishna went on a peace mission. Within a fortnight of this mission, the war must have started according to them, which however throws up a lot of improbabilities. But none thought for a moment how and why Bhishma, an adept in calculating the movement of the sun and the moon, miserably failed to judge the arrival of Uttarayana, for which he had to wait for not just a week or a paksha (fortnight) but nearly two months!

Additionally we have now found a discrepancy in the normal sequence of the calendar dates from the 2nd year of the Yuga. **HOW COULD SHUKLA TRITIYA SLIP BACK TO SHUKLA ASHTAMI IN THE FOLLOWING YEAR?**

⁴⁵⁰“When Did The Mahabharata War Happen?” Page 131.

⁴⁵¹ Mahabharata: 12-47-3 (Gita Press edition)

This is a proof for the loss of tithis in two paksha-s (phases) caused by a sudden irregular movement of the moon. Four tithis in all were lost due to two Trayodasi phases – by which Uttarayana advanced by 4 tithis, i.e. from Shukla Trayodasi to Shukla Ashtami! **This also testifies that this research is going in the right direction.**

This is remarkable confirmation of the celestial impact that changed ‘Time’. Time was different before 3136 BCE; what we now follow is the cosmically altered Time ever since an asteroid or comet hit the surface of the moon on 2nd September 3136 BCE!

Let me produce the changed calendar for Uttarayana of Vishvavasu when Bhishma shed his mortal body.

Year No	Year in Yuga	Uttarayana started in Magha			Dakshinayana started in Ashadha			Year Name	Gregorian
		Tithi	Sun star	Moon Star	Tithi	Sun Star	Moon Star		
1	Samvatsara	Sh 1	U-Asha	U-Ashadha	Sh-7	Punarvasu	U-Phal	Krodhi	-3136
2	Parivatsara	Sh - 8	U-Asha	Rohini	Sh- 14	Punarvasu	Dhanishtha	Vishvavasu	-3135
3	Idvatsara	Kr -5	U-Asha	Swati	Kr - 11	Punarvasu	Punarvasu	Parabhava	-3134
4	Anuvatsara	Sh - 2	U-Asha	U-Bhadra	Sh - 8	Punarvasu	Jyeshtha	Plavnga	-3133
5	Vatsara	Sh - 14	U-Asha	Magha	Kr - 5	Punarvasu	Bharani	Keelaka	-3132
			Pushya Month						
1	Samvatsara	Kr - 11	U-Asha	U-Ashadha	Sh - 2	Punarvasu	U-Phal	Saumya	-3131

Figure 49: The changed calendar since Mahabharata war

Important observations from the above Figure 49:

- The first row shows the first two ayanas of the 1st year in natural sequence of the calendar until then.
- The 2nd row shows the tithi – nakshatra of the Uttarayana time (of the 2nd year) that Bhishma was waiting for. It ought to have been Shukla Trayodasi in Magha, but it turned out to be Shukla Ashtami – 4 tithis behind.

Interestingly the star of the day remained the same in the 2nd and subsequent years as it used to be in the original calendar. *Only the tithi had changed*. This was because the star of the day did not change even after the asteroid-hit – a fact that we deduced in the last chapter in the version of Karna that Gara karana was expected on Citra. In normal course Bhava karana should have occurred in Citra.

No simulator, including the Jhora set to Surya Siddhanta ayanamsa can detect this as they are all set to the standard tithi- nakshatra alignment.

And none doing manual calculation can get the Mahabharata date right, because of the unexpected loss of tithis.

When I further checked to locate the first day of the next Yuga, when the sun turned northward at zero degree Capricorn, it occurred on Pushya Shukla Saptami with the moon at Uttara Bhadrapada. (Fig 50) This implies that **Time slipped backwards!** We cannot match with Krishna Ekadasi for the next Yuga (Fig 49), for that means 19 more tithis (and 22 stars) to go, but then the sun would have moved 20 degrees ahead in Capricorn to be at Shravana.

Body	Longitude	Nakshatra	Pada				
Lagna	10 Cp 35' 18.69"	Srav	1	Sa	Mo	Ra	AL
Sun - DK	0 Cp 35' 06.67"	USha	2				
Moon - MK	16 Pi 38' 27.65"	UBha	4				
Mars - PiK	13 Li 44' 05.48"	Swat	3				
Mercury - PK	11 Sg 42' 11.96"	Mool	4				
Jupiter - AmK	18 Li 12' 28.80"	Swat	4				
Venus - BK	17 Sc 21' 33.64"	Jye	1				
Saturn - AK	24 Pi 22' 54.96"	Reva	3				
Rahu - GK	24 Ar 32' 56.47"	Bhar	4				
Ketu	24 Li 32' 56.47"	Visa	2				

Date:	October 23, -3131	Vedic Weekday:	Wednesday (Me)
Time:	7:00:17 am	Nakshatra:	Uttarabhadra (Sa)
Time Zone:	5:30:00 (East of GMT)		(0.19% left)
Place:	78 E 01' 00", 29 N 10' 00"	Sunrise:	6:18:03 am
	Hastinapur, India	Sunset:	4:23:12 pm
		Janma Ghatik:	1.7594
Lunar Yr-Mo:	Saumya - Pushya	Ayanamsa:	0-26-19.49
Tithi:	Sukla Saptami (Sa)		
	(66.20% left)		

Figure 50: Uttarayana in the 1st year of the next Yuga after the Mahabharata war

One should keep in mind that there was no change in the movement of the sun; the day it turned northward remained undisturbed. Only the timing of that event in terms of tithi- star-month got disturbed. Basically the enumeration of the lunar month was disturbed with the associated occurrence of Adhika Masa!

So some unexpected cause had changed Time once for ever and this change of time coming into use from the time of Magha Shukla Saptami was frozen into memory as Ratha Saptami!

Ratha Saptami, an evidence for the change of Time in Mahabharata

Ratha Saptami marking a change in the direction of the chariot of the Sun God, celebrated even today is proof of the importance attached to this particular day. The sudden change in time resulting in the sun turning northward on Magha Shukla Saptami was preserved in

memory for all times to come by infusing certain practices by way of oblations to the departed on this day. No Mahabharata researcher can afford to ignore the significance of this day waited upon by Bhishma to come out of the distress he was undergoing on the arrow bed. He left the world in the next tithi (Ashtami).

Further concurrence for this comes from the rules of ‘**Ratha Saptami Vrat**’ attributed to sage Garga.⁴⁵² Ratha Saptami vrat must be observed in Magha when there is “**Tithi-dvayam**” at sun rise. Tithi-Dvayam means two tithis within two sunrises. The previous tithi must end any time after the sun rise in a day, followed by the next tithi which also ends after the sun rise the next day. For Ratha Saptami Vrat, *Shashthi tithi must have ended the previous day, followed by Saptami tithi*. This tithi (Saptami) must be present at sunrise the next morning but end up after some time, so that **ASHTAMI WOULD BEGIN IN THE SAME DAY**.

Tithi Dvayam is a conditional feature of Ratha Saptami, indicating similar Tithi Dvayam on the day Bhishma left. By its presence at sunrise, Saptami would be the tithi of the day marking the northward turn of the sun, but Ashtami should follow sometime soon. This must be present on the day Bhishma left. The date of Uttarayana should fulfil this condition. We will check this as we proceed with the derivations systematically.

The Ratha (of Surya) that Bhishma waited for, to bring peace to him is preserved in tradition as a Homa, known as “**BHISHMA RATHA SHANTI HOMA**”. This is done even today on completion of 70 years of age, though it needs to be ascertained whether this number refers to Bhishma’s age or the number of decades being equal to the number of tithis he waited after Magha started. Some people mistakenly mention this as **BHEEMA RATHA SHANTI**. The Ratha of Surya was waited upon by Bhishma, not Bheema.

The various austerities related to Bhishma’s departure as seen on Ratha Saptami, Bhishmashtami (when he left the world) and Bhishma Ratha Shanti that continue to be in vogue today are the standing proof of the unexpected change of time of the Uttarayana after the Mahabharata war.

There is another austerity having relevance to Magha Saptami, known as “**MANDĀRA SAPTAMI**” vrat done on *Magha “Shuddha” Saptamī*.⁴⁵³ This sounds strange because ‘Shuddha’ refers to ‘Nija’ masa in usage. Nija or Shuddha masa is the month following the Adhika Masa. Mandāra means Heaven. Those desiring to go to Heaven should do this vrat

⁴⁵² “Jothida Varushadhi Nool” (Tamil), Kumaran Padhippagam, Chennai, p. 388

⁴⁵³ “Jothida Varushadhi Nool” (Tamil) p.381

which goes on for **13 months** starting from Magha shuddha Saptamī says the astrological text. This implies that this vrat is possible only in the year having an Adhika masa. An Adhika masa coming in between two Magha Shukla (waxing) Saptami fulfils the 13 month duration of the vrat. But the reference to Magha “Shuddha” Saptami and “Mandāra” being the fruit of the vrat – something on the lines of what Bhishma achieved, this seems to be connected with Mahabharata time or to have originated from an event of Mahabharata.

The reference “Shuddha” to Magha sounds strange as **THERE CAN NEVER BE A NIJA OR SHUDDHA MAGHA, BECAUSE ADHIKA MASA CAN NEVER OCCUR IN THE MONTH OF MAGHA!**

Can Adhika Masa occur in Magha month?

Adhika masa is the month when two New moons occur in a solar month or in other words, when there is no solar ingress in a lunar month. In this context it is necessary to know about another type of anomalous month, called **Kshaya Masa**, when there are 2 solar ingresses (Sankranti) within a lunar month. In this event the lunar month is stretched into two signs of the zodiac such that the solar ingress occurs after the lunar month begins and the 2nd solar ingress into the next sign occurs before the lunar month ends. This happens because of the faster movement of the earth at perihelion that covers the months from Margashira to Magha. Therefore the Kshaya Masa always occurs within these months and not at any other month. This also means that the Adhika Masa can never occur in the months Margashira, Pushya and Magha!

Any time a Kshaya Masa occurs, it would be accompanied with two Adhika Masa, one before and another after the Kshaya Masa. This one-in-**149 year phenomenon** occurred the last time in the year 1983 offering us a good case study. The Kshaya Masa started on **14th January 1983** when the solar ingress into Capricorn (Makara Sankranti) started after Shukla Pratipat of the lunar Pushya month, and ended on 13th February before the lunar month ended. The very next month, Phalguna was an Adhika Masa with no solar ingress. Before the Kshaya Masa, an Adhika Masa occurred in Aswayuja. This recent event of Kshaya Masa occurring in a month at the perihelion of lunar orbit, with an Adhika Masa immediately following it and another Adhika Masa a couple of months before the Kshaya Masa offers a better understanding of these anomalous months.

Normally the Adhika Masa occurs any time between Phalguna and Aswayuja and not in the rest of the 4 months. Rarely the Adhika Masa can happen in Kartika, but never in Margashira, Pushya and Magha. Strangely we come across a vrat that suggests that there was an Adhika

Masa in Magha! Stranger than that is the change in the date of Uttarayana that started in Magha after the Mahabharata war; strangest is the fact the all-knowing Bhishma failed to calculate the date of Uttarayana correctly.

In this context I want to show the readers the absurdity of following the tropical simulator that works on continuing precession of the equinox. Now having known that Adhika Masa can never occur in Magha, let me show that it can, when we use the continuous precession of the tropical zodiac.

Figure 51 is simulated to continuous precession, showing Adhika Masa in the month Magha, but two years earlier than Krodhi, i.e. in Shubhakrit, in 3138 BCE. Figure 8 shows the succeeding month, the Nija Masa in Magha! From this one can also understand how erroneous the deductions are, shown by Nilesh Oak from his Voyager simulator that is working on the same ayanamsa calculation as this.

Body	Longitude	Nakshatra	Pada
Lagna	1 Le 03' 26.41"	Magh	1
Sun - DK	0 Cp 14' 45.70"	USha	2
Moon - GK	1 Cp 59' 41.23"	USha	2
Mars - AmK	9 Sg 59' 36.64"	Mool	3
Mercury - BK	7 Sg 58' 55.80"	Mool	3
Jupiter - MK	5 Pi 28' 06.88"	UBha	1
Venus - AK	12 Aq 24' 15.16"	Sata	2
Saturn - PiK	5 Sg 13' 45.91"	Mool	2
Rahu - PK	24 Vi 50' 10.37"	Chit	1
Ketu	24 Pi 50' 10.37"	Reva	3

Date:	November 2, -3138
Time:	7:28:57 pm
Time Zone:	5:30:00 (East of GMT)
Place:	77 E 12' 00", 28 N 36' 00" New Delhi, India
Lunar Yr-Mo:	Shubha-krit - Adhika Magha
Tithi:	Sukla Pratipat (Su) [Kaameswari] (85.43% left)
Vedic Weekday:	Thursday (Ju)
Nakshatra:	Uttarashadha (Su) (60.04% left)
Yoga:	Harshana (Su) (33.19% left)
Karana:	Kimstughna (Ve) (70.85% left)
Sunrise:	6:50:41 am
Sunset:	5:38:23 pm
Janma Ghati:	31.5944
Ayanamsa:	312-54-20.01

Figure 51: Adhika Magha in the year Shubhakrit (3138 BCE)

The next month was Nija Magha which, though the simulator recognises as Shubhakrit, was in reality Shobhakri, the next year, due to the fact that the year was counted from Uttarayana in the 5 year Yuga calendar.

Body	Longitude	Nakshatra	Pada
Lagna	9 Aq 02' 34.51"	Sata	1
Sun - PiK	7 Aq 09' 28.22"	Sata	1
Moon - DK	3 Ta 42' 57.12"	Krit	3
Mars - MK	8 Cp 12' 53.34"	USha	4
Mercury - GK	5 Aq 42' 44.73"	Dhan	4
Jupiter - AmK	12 Pi 27' 14.88"	UBha	3
Venus (R) - AK	12 Aq 42' 04.98"	Sata	2
Saturn - BK	8 Sg 43' 24.71"	Mool	3
Rahu - PK	22 Vi 54' 06.66"	Hast	4
Ketu	22 Pi 54' 06.66"	Reva	2

Date:	December 9, -3138
Time:	7:28:57 am
Time Zone:	5:30:00 (East of GMT)
Place:	77 E 12' 00", 28 N 36' 00"
	New Delhi, India
	Shobhakrit
Lunar Yr-Mo:	Shubha-Krit - Nija Magha
Tithi:	Sukla Ashtami (Ra) [Tvarita]
	(78.68% left)
Vedic Weekday:	Saturday (Sa)
Nakshatra:	Krittika (Su)
	(47.13% left)
Sunrise:	7:20:22 am
Sunset:	5:29:57 pm
Janma Ghati:	0.3574
Ayanamsa:	312-54-24.93

Figure 52: Nija Magha in the year Shobhakrit (3138 BCE)

This simulation can not true for the reasons that (1) it is based on an unrealistic precession degree of 312-54 and (2) it occurred 37 years before the end of Krishna or the beginning of Kali Maha Yuga.

Now checking the same for the precession rate of Surya Siddhanta that was close to zero at the time of Mahabharata war, the adhika Masa didn't appear in Magha. So it is clear that Adhika Masa could not have occurred as a natural sequence of the different speeds of the moon and the earth (detected in the movement of the sun) in the month Magha in general but it seemed to have occurred in the year Krodhi when Bhishma waited for a prolonged period on the arrow bed.

With Caitra of Krodhi being an Adhika Masa, no kshaya masa could have occurred in Magha that year; and no Adhika masa too could have occurred any time after Caitra in that year, so what happened then?

To unravel this mystery let me begin deriving the date from the beginning of the exile.

Reconstructing the start and the end date of Pandava's exile.

The sequence of events before the identity of the Pandavas became known is narrated in Mahabharata along with the tithis when such events occurred. This greatly helps in deducing the start and the end date of the exile period.

- **Susarma**, the king of Trigarta started seizing the cattle of the Matsya country on a Krishna Saptamī. The month name is not given.
- The Matsya troops began chasing the Trigartas after the sun crossed the meridian, on **Krishna Saptamī** and the fight continued at night. The Pandava brothers except Arjuna accompanied the Matsya king in the fight. They defeated Susarma in the night of Krishna Saptami after the moon had risen. They stayed in the battle field for the rest of the night. Messengers were sent to the city gate to give the victory news by next morning.⁴⁵⁴
- While the Matsya troops were away, the Kauravas started seizing the cattle of the Matsya country on the morning of **Krishna Ashtami**.⁴⁵⁵ This happened before the victory news reached the palace.
- At that time **Uttara** (named Bhuminjaya), the Matsya prince, was in the capital. Arjuna in the guise of Vrihannala accompanied Uttara as his charioteer to challenge the Kauravas. This happened on the same day.
- *Arjuna revealed his true identity to Uttara on the same day*, that is, on Krishna Ashtami! He also told him that he had completed one year of *vrat* in his (Matsya) kingdom.⁴⁵⁶ So according to Pandava's time keeping, they had completed one year period of incognito by Krishna Ashtami.
- Arjuna didn't conceal his identity in the fight with the Kauravas. He hoisted his Ape-banner on the chariot while fighting. This created a flutter among the Kauravas raising doubts about the exact number of days completed by the Pandavas in exile and it was clarified by Bhishma (explained earlier).
- Arjuna (**Vrihannala**) with the chariot driven by Uttara successfully chased away the Kauravas and restored the cattle. The two returned to the palace on the same day, i.e. Krishna Ashtami.
- When they entered the royal court, the king was already seated, but Arjuna didn't reveal his identity.

⁴⁵⁴ Mahabharata: 4-32-50 <http://www.sacred-texts.com/hin/mbs/mbs04032.htm>

⁴⁵⁵ Mahabharata: 4-29-28 <http://www.sacred-texts.com/hin/mbs/mbs04029.htm>

⁴⁵⁶ Mahabharata: 4-40- 12 & 13 <http://www.sacred-texts.com/hin/mbs/mbs04040.htm>

On the 3rd day after that, all the Pandavas revealed themselves openly. It is written “*tatas tṛtīye divase*”.⁴⁵⁷ This can be taken as the third day counted from Ashtami. (tatas = thence, thereupon, after that)

That is the day of **KRISHNA DASAMI!**

The month or ayana is not given. However the running season at that time is revealed in the words of Karna that their troops had come to an unknown place possessed by enemies and in the mighty forest in the hot **GREESHMA SEASON**.⁴⁵⁸

Greeshma has two solar months, Mithuna and Kataka and the corresponding lunar months, Jyeshtha and Ashadha. If the date Arjuna revealed himself was Jyeshtha Krishna Ashtami, it was in the first half of the season when the sun was at mid-Mithuna. Since exhaustion of the troops is hinted in the verse for having travelled a long way in the Greeshma season, it is deduced that it was peak Greeshma. This matches with the second half of the season when Ashadha was running.

Dakshinayana started on Shukla Saptami in Ashadha month when the sun was in Punarvasu (at the junction of Mithuna and Kataka) and the moon in Uttara Phalguni (Figure 4). Karna’s reference to Greeshma season coming on the day of Krishna Ashtami, it is more likely to be the month of Ashadha after Dakshinayana had begun. Counting from Uttara Phalguni on Ashadha Shukla Saptami (Dakshinayana day) to Ashadha Krishna Ashtami, there are 16 tithis / stars. The star happens to be Aswini on Ashadha Krishna Ashtami. The third day from that is Kritika!

The Pandavas revealed themselves on Ashadha Krishna Dasami when the moon was in Kritika.

This goes to show that they started the exile period in Ashadha Krishna Dasami 13 years ago, in the year Khara corresponding to 3149 BCE! Rohini was running then. (Fig 53)

⁴⁵⁷ Mahabharata: 4-65-1 <http://www.sacred-texts.com/hin/mbs/mbs04065.htm>

⁴⁵⁸ Mahabharata: 4-42-22

adeśikā mahāraṇye grīṣme śatruvaśaṃ gatā
yathā na vibhramet senā tathā nītir vidhīyatām
<http://www.sacred-texts.com/hin/mbs/mbs04042.htm>

Body	Longitude	Nakshatra	Pada
Lagna	21 Cn 33' 29.06"	Asre	2
Sun - MK	12 Cn 13' 10.59"	Push	3
Moon - PiK	11 Ta 08' 07.39"	Rohi	1
Mars - AK	29 Vi 24' 05.80"	Chit	2
Mercury - AmK	28 Ge 56' 51.30"	Puna	3
Jupiter - DK	0 Ar 19' 21.58"	Aswi	1
Venus - GK	3 Le 29' 59.53"	Magh	2
Saturn - BK	25 Le 13' 51.82"	PPha	4
Rahu - PK	21 Ar 52' 42.78"	Bhar	3
Ketu	21 Li 52' 42.78"	Visa	1

Date:	<u>May 7, -3149</u>
Time:	7:00:00 am
Time Zone:	5:30:00 (East of GMT)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India
Lunar Yr-Mo:	<u>Khara - Ashadha</u>
Tithi:	<u>Krishna Dasami (Mo) [Nitya]</u> (9.04% left)
Vedic Weekday:	Sunday (Su)
Nakshatra:	<u>Rohini (Mo)</u> (91.48% left)
Sunrise:	6:16:36 am
Sunset:	8:08:17 pm
Ayanamsa:	<u>0-42-56.52</u>

Figure 53: The date of the start of the exile

Body	Longitude	Nakshatra	Pada
Lagna	25 Cn 44' 16.00"	Asre	3
Sun - MK	16 Cn 38' 11.09"	Push	4
Moon - PK	8 Ta 19' 52.49"	Krit	4
Mars - PiK	10 Vi 31' 55.48"	Hast	1
Mercury - DK	2 Cn 17' 13.82"	Puna	4
Jupiter - GK	7 Ta 57' 53.00"	Krit	4
Venus - AK	26 Le 15' 17.02"	PPha	4
Saturn (R) - AmK	24 Cp 59' 39.23"	Dhan	1
Rahu - BK	10 Le 02' 30.35"	Magh	4
Ketu	10 Aq 02' 30.35"	Sata	2

Date:	<u>May 11, -3136</u>
Time:	7:00:00 am
Time Zone:	5:30:00 (East of GMT)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India
Lunar Yr-Mo:	<u>Krodhi - Ashadha</u>
Tithi:	<u>Krishna Dasami (Mo) [Nitya]</u> (69.21% left)

Vedic Weekday:	Sunday (Su)
Nakshatra:	<u>Krittika (Su)</u> (12.52% left)
Sunrise:	6:17:20 am
Sunset:	8:06:22 pm
Ayanamsa:	<u>0-31-13.84</u>

Figure 54: The date of the end of the exile

The Pandavas ended the exile on 11th May, 3136 BCE in the year Krodhi when the moon was in Krittika at sunrise. Dakshinayana had already begun by then. The Jhora simulation perfectly matches with the 13 year exile derivation and the extra days. (Fig 55)

Gregorian year	Year No	U - Uttarayana. D - Dakshinayana	Adhika masa		Year name
	(Solar)		(lunar)		
	2	U			Vikruti
		D			
-3149	3	U			Khara
	Start	D Started here		Exile yr	
-3148	4	U		1	Nandana
		D			
-3147	5	U	Vaisakha	2	Vijaya
		D			
-3146	1	U		3	Jaya
		D			
-3145	2	U		4	Manmatha
		D	Aswayuja		
-3144	3	U		5	Durmukhi
		D			
-3143	4	U		6	Hevilambi
		D			
-3142	5	U		7	Vilambi
		D	Sravana		
-3141	1	U		8	Vikari
		D			
-3140	2	U		9	Sarvari
		D			
-3139	3	U	Jyeshtha	10	Plava
		D			
-3138	4	U		11	Shubhakrit
		D			
-3137	5	U		12	Shobhakrit
		D			
-3136	1	U	Caitra	13	Krodhi
		D - Exile ended. War Occurred			

Figure 55: The exile period of the Pandavas

The exile started in Khara year (3149 BCE), in Dakshinayana, Ashadha Krishna Dasami when the moon was at Rohini at sunrise.

The exile ended in Krodhi year (3136 BCE), in Dakshinayana, Ashadha Krishna Dasami when the moon was at Krittika at sunrise. Within the 13 year period, 5 Adhika Masa-s occurred, with the last one two months before the end of exile. The five Nija Masa (that followed five Adhika Masa) details are given in Figures 56, 57 and 58.

1 st Nija Masa		2nd Nija Masa	
Date:	<u>February 20, -3147</u>	Date:	<u>July 26, -3145</u>
Time:	7:00:00 am	Time:	7:00:00 am
Time Zone:	5:30:00 (East of GMT)	Time Zone:	5:30:00 (East of GMT)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India	Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India
Lunar Yr-Mo:	<u>Vijaya - Nija Vaisakha</u>	Lunar Yr-Mo:	<u>Manmatha - Nija Aswayuja</u>
Tithi:	Sukla Pratipat (Su) [Kaameswari] (59.66% left)	Tithi:	Sukla Pratipat (Su) [Kaameswari] (47.80% left)
Vedic Weekday:	Thursday (Ju)	Vedic Weekday:	Monday (Mo)
Nakshatra:	Krittika (Su) (35.77% left)	Nakshatra:	Chitra (Ma) (3.76% left)
Sunrise:	6:13:27 am	Sunrise:	6:07:17 am
Sunset:	7:08:19 pm	Sunset:	6:06:12 pm
Ayanamsa:	<u>0-41-19.69</u>	Ayanamsa:	<u>0-39-08.70</u>

Figure 56: The Nija Masa-s in BCE 3147 and 3145.

3 rd Nija Masa		4th Nija Masa	
Date:	<u>May 24, -3142</u>	Date:	<u>March 23, -3139</u>
Time:	7:00:00 am	Time:	7:00:00 am
Time Zone:	5:30:00 (East of GMT)	Time Zone:	5:30:00 (East of GMT)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India	Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India
Lunar Yr-Mo:	<u>Vilamba - Nija Sravana</u>	Lunar Yr-Mo:	<u>Plava - Nija Jyeshtha</u>
Tithi:	Sukla Pratipat (Su) [Kaameswari] (32.66% left)	Tithi:	Sukla Pratipat (Su) [Kaameswari] (86.49% left)
Vedic Weekday:	Friday (Ve)	Vedic Weekday:	Wednesday (Me)
Nakshatra:	Magha (Ke) (49.64% left)	Nakshatra:	Mrigasira (Ma) (38.42% left)
Sunrise:	6:18:47 am	Sunrise:	6:09:26 am
Sunset:	7:56:43 pm	Sunset:	7:46:59 pm
Ayanamsa:	<u>0-36-35.98</u>	Ayanamsa:	<u>0-34-03.11</u>

Figure 57: The Nija Masa-s in BCE 3142 and 3139

5th Nija Masa	
Date:	<u>January 20, -3136</u>
Time:	7:00:00 am
Time Zone:	5:30:00 (East of GMT)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India
Lunar Yr-Mo:	<u>Krodhi - Nija Chaitra</u>
Tithi:	Sukla Pratipat (Su) [Kaameswari] (76.40% left)
Vedic Weekday:	Sunday (Su)
Nakshatra:	Aswini (Ke) (82.48% left)
Sunrise:	6:24:21 am
Sunset:	6:24:11 pm
Ayanamsa:	<u>0-31-30.39</u>

Figure 58” The Nija Masa in BCE 3136

The details of the Nija Masa simulated to the ayanamsa of the Mahabharata time are given above to emphasise the fact that one cannot simply ‘insert’ an Adhika Masa like Nilesch Oak did to suit his date of Mahabharata. He “conjectured” an Adhika Masa that “*a lunar month in addition to 7 days passed between Krishna-Karna dialogue and the first day of Mahabharata War.*”⁴⁵⁹

The above derivations reveal that an Adhika Masa occurred a few months before the exile ended, while another one sounds probable just after the war in the same year, but not before the war. There lies a hidden issue on Time that was variously explained so far, all pointing out to a loss of tithis on a Pushya day in the month of Kartika when Krishna was in Hastinapur on a peace mission.

The next task is to establish **the ritu- calculation** of Mahabharata calendar, to locate the time of Krishna’s peace mission that Mahabharata says happened in Sharad ritu, but claimed by Nilesch Oak as having taken place in Varsha season! “*This is based on the assumption that Mahabharata astronomers defined the seasons in the same fashion, as we understand them today,*” writes Oak.⁴⁶⁰ His entire ‘research’ is fit to be rejected for this single sentence alone. The description of the Mahabharata calendar given above must convince the reader that it is entirely different and not the same as what he deduces by Voyager-Simulator Nyaya.

Ritu-calculation of the Mahabharata Calendar.

Earlier in the 4th chapter I quoted verses from Rig and Yajusha Jyotisha on the extent of a ritu (season). A ritu (season) consists of four and a half stars. This entirely covers 2 zodiacal signs, by which we understand that two solar months make one season.

Yajusha Jyotisha further defines a season in terms of lunar months. It says that a season occurs at an interval of 2 lunar months and 2 tithis.⁴⁶¹ This doesn’t contradict the other verse on the asterismal duration of a season, given the fact that for every lunar month, one day increases. So in a season consisting of two solar months or two zodiacal signs, there would occur 2 lunar months and 2 tithis. In the 5-year Yuga calendar, the lunar month based calculation of the season starts from the 1st year of the Yuga, i.e. from Uttarayana in the month of Magha.

Figure 59 shows the tithi of the day at the commencement of a season. Using the Tithi- Star table in Figure 4, we can construct the Tithi-ritu-ayana-month table for the entire 5 year

⁴⁵⁹ “When did the Mahabharata War Happen?” p.114

⁴⁶⁰ Ibid., p.150

⁴⁶¹ Yajur Vedanga Jyotisha: verse 11

period of the Yuga to know when a particular season in a given year ended. I have highlighted the Greeshma ritu (Karna's version) in the 1st year when the Pandavas revealed their identity. The next season was Varsha, followed by Sharad season when Krishna went on a peace mission.

Based on the beginning tithi, it is possible to arrive at the date of the mission. From the second year onwards, time underwent change. Though the Mahabharata characters must have kept track of the lunations and tithis for religious purposes in that confusing period, a new record for calendar purpose had come to stay from the Uttarayana of the 2nd year. From the 2nd year onwards the tithi-ritu- ayana alignment was different from how it was earlier. It is shown in red colour in the last two columns. The changed time period is boxed in blue. Mahabharata war had taken place in that period.

Year	Ayana	Month	Season	Tithi	Changed	
1	U	Magh+Phal	Shishira	S-1		K-11
	U	Chai +vaish	Vasanta	S-3		K-13
	U	Jyesh +Asha	Greeshma	S-5		Amawasya
	D	Shra+Bhadra	Varsha	S-7		S-2
2	D	Ashva+Karti	Sharad	S-9		S-4
	D	Marga+Push	Hemanta	S-11		S-6
	U	Magh+Phal	Shishira	S-13	→ S-8	
	U	Chai +vaish	Vasanta	Purnami	S-10	
3	U	Jyesh +Asha	Greeshma	K-2	S-12	
	D	Shra+Bhadra	Varsha	K-4	S-14	
	D	Ashva+Karti	Sharad	K-6	K-1	
	D	Marga+Push	Hemanta	K-8	K-3	
	U	Magh+Phal	Shishira	K-10	K-5	
	U	Chai +vaish	Vasanta	K-12	K-7	
	U	Jyesh +Asha	Greeshma	K-14	K-9	
	D	Shra+Bhadra	Varsha	S-1	K-11	
4	D	Ashva+Karti	Sharad	S-3	K-13	
	D	Marga+Push	Hemanta	S-5	Amawasya	
	U	Magh+Phal	Shishira	S-7	S-2	
	U	Chai +vaish	Vasanta	S-9	S-4	
	U	Jyesh +Asha	Greeshma	S-11	S-6	
	D	Shra+Bhadra	Varsha	S-13	S-8	
	D	Ashva+Karti	Sharad	Purnami	S-10	
	D	Marga+Push	Hemanta	K-2	S-12	
5	U	Magh+Phal	Shishira	K-4	S-14	
	U	Chai +vaish	Vasanta	K-6	K-1	
	U	Jyesh +Asha	Greeshma	K-8	K-3	
	D	Shra+Bhadra	Varsha	K-10	K-5	
	D	Ashva+Karti	Sharad	K-12	K-7	
	D	Marga+Push	Hemanta	K-14	K-9	

Figure 59: Ayana-month-season-tithi alignment in 5-year Yuga

Date of Krishna leaving Upaplavya on peace mission.

It was established earlier that the Pandavas returned in the 1st year of the Yuga, in Ashadha Krishna Dasami. This was 17 days after Dakshinayana began (Fig 48) and 11 days before Greeshma season ended (Fig 59). Varsha, the next season started on Shukla Saptami of Sravana month.

- No events are reported in **Varsha** season. However there is scope to speculate that the marriage of Abhimanyu was conducted in this season in Shravana month, which is auspicious for marriage ceremony.
- Sharad (rainy) was the next season that started on Shukla Navami of Aswayuja month. The war preparations started from this season onwards.
- Krishna started on a peace mission at the end of the Sharad season in Kaumudi month in Revati nakshatra. This verse from Mahabharata is a point of contention for Nilesh Oak who interprets Kaumudi as a “month of lotuses”.

Which month is Kaumudi?

The verse is, “*kaumude māsi revatyām śarad ante himāgame*.”⁴⁶²

This refers to the end of Sharad season (Sharad ante) in the month of Kaumudi (another name for Kartika month). ‘Himagame’ denotes the arrival of Hemanta season. Aswayuja and Kartika together form the Sharad season. The end of Sharad season is indicative of Kartika month.

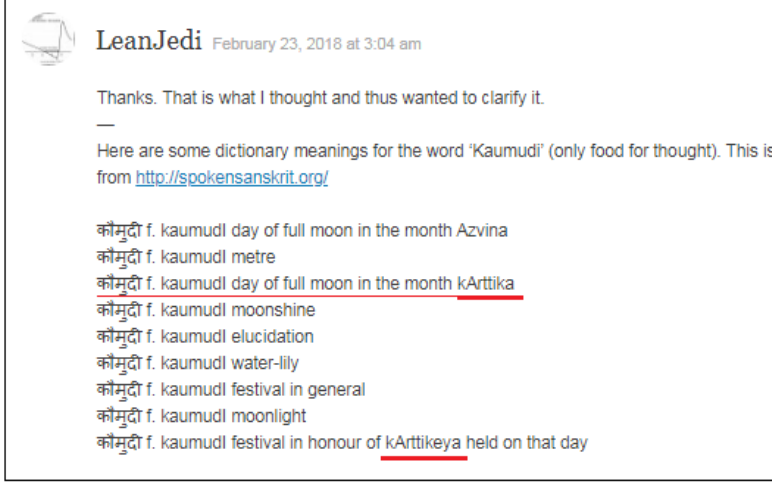
Nilesh Oak blatantly ignores the reference to Sharad season, and chooses to bring in Varsha season by interpreting ‘Kaumudi’ as ‘**the month of lotuses**’, obviously for the reason, that his date can be fitted in a scheme of Krishna going on the mission in Varsha season!

This idea is also not his own, but lifted from Vartak Bharata. He says, “I am happy to borrow ‘Kaumudi’ interpretation of Vartak. Vartak interpreted ‘*Kaumudi mase*’ to mean ‘*during the month of lotuses*’ rather than ‘*during the month of Kartika*’ and this interpretation corroborates well with the timing of Krishna’s departure from Upaplavya on 31 August, in the middle or at the end of the rainy season.”⁴⁶³

⁴⁶² Mahabharata: 5-81-7 <http://www.sacred-texts.com/hin/mbs/mbs05081.htm>

⁴⁶³ “When Did the Mahabharata War Happen?” p. 151

In support of his contention he produced the list of meanings from <https://spokensanskrit.org/> in the comment section of his blog on Feb 2018, but lest he realised that he was indeed producing evidence for Kartika month from that list.⁴⁶⁴



One of the meanings of Kaumudi is the day of Full moon in Kartika. Since the month gets the name from the Full moon, it is obvious that Kartika was also known as Kaumudi. And Kartika is a month of celebration of Kartikeya. From the last meaning it is known that *Kaumudi festival was celebrated in honour of Kartikeya* – which can happen only in Kartika month. In substance, Oak has unwittingly produced evidence in support of Kartika month. Now our task is to establish beyond doubt that Kaumudi refers to Kartika month.

The name Kaumudi was in common usage until a thousand years ago. Kaumudi festival is perhaps the oldest festival starting from the times of Mahabali who offered land to Vamana. It is explained in the context of the festival of Deepavali in memory of Bali in Padma Purana. While describing Deepavali, Padma Purana refers to the beginning of that festival on the thirteenth day (Trayodashi) of the waning phase of Kartika month, which is a reference to the month of Aswayuja, before Amawasya.⁴⁶⁵ Light is offered to Yama on this day. On the next day (Krishna caturdasi), light is offered to Naraka, says the Purana. Then on the next day that happens to be the New moon day (Amawasya), charities and celebrations done by the king are explained, followed by worship of Mahabali at night by keeping awake. **Padma Purana** states that the “Kaumudi” festival started since then. Perhaps Kaumudi was the earlier name for the Deepavali festival.

⁴⁶⁴ “Debating evidence, method & inferences: Oak vs Koch –Part 9”

<https://nileshoak.wordpress.com/2017/12/08/debating-evidence-method-inferences-oak-vs-koch-part-9/>

⁴⁶⁵ Padma Purana: Uttara Khanda- Ch 122. <https://www.wisdomlib.org/hinduism/book/the-padma-purana/d/doc365701.html>

The same festival is described in **Skanda Purana** as Bali Pratipat, done on the first day of the bright phase of Kartika month.⁴⁶⁶ The festivities are mentioned in the same way as written in Padma Purana with an information that it was the beginning of Kaumudi festival. So by all means, Kaumudi is connected with Kartika month. Padma Purana refers to Aswayuja as Kartika but relates Kaumudi festival to the month next to Aswayuja, i.e. Kartika.

Padma Purana gives the meaning for Kaumudi, by splitting the word as Ku and Muda, where *‘ku’ stands for earth and ‘muda’ for joy*. It says,

“Due to the root (meaning) of the two (words coming together) the festival is said to be (i.e. called) Kaumudī, since the people mutually rejoice (during it) on the earth. They are glad and pleased, are happy, so it is called Kaumudī. O son, since during it red lotuses are offered to Bali by kings for (removing) their sins, therefore it is called Kaumudī.”

The lotus is part of the festivity and not the basis for the name of the festival. Perhaps the flower - the lotus or water lilly got the name Kaumudi from the etymology given by Padma Purana. Kartika in Sharad season is the time all the water bodies are full and cool- a suitable time for the bloom of lotus and water lillies. That is how Kartika came to be known as the month of lotuses. Such bloom cannot be seen in Varsha season dotted with frequent rains, making the water bodies turbulent. Lotus and lillies don’t grow in the turbulent waters of the rainy season.

In the very next line of the same verse on Kaumudi, the **growth of abundant crops** is mentioned as *“sphītasasyamukhe kāle kalyaṇ sattvavatām varaḥ”*, thereby rejecting any scope for an interpretation that it was rainy reason.⁴⁶⁷

Kaumudi festival seems to have a specific significance for the *recovery of lost lands*. By worshiping Bali who donated the earth to Vamana, a king can prosper for a whole year, says Padma Purana. This connotation is found in the coronation of **King Kalyanavarman** of Magadha who was re-instated into the throne on the day of Kaumudi Mahotsav, the Full Moon Festival in Kartika month. A Sanskrit drama, **‘Kaumudi Mahotsav’** detailing this event in the life of this king of the 7th century CE, was staged at the palace of Suganga at Pataliputra on the “Autumnal Full Moon Festival Day”, i.e. Sharad Kaumudi Mahotsav.⁴⁶⁸ Going by the description of this festival in Padma and Skanda Purana, it appears that

⁴⁶⁶ Skanda Purana- Vaishnava Khanda – Ch 10. <https://www.wisdomlib.org/hinduism/book/the-skanda-purana/d/doc371651.html>

⁴⁶⁷ 5-81-7 <http://www.sacred-texts.com/hin/mbs/mbs05081.htm>

⁴⁶⁸ “The Historical Drama of Kaumudi-Mahotsava, or Full-Moon Festival”, Sakuntala Rao Sastri https://www.jstage.jst.go.jp/article/ibk1952/4/2/4_2_590/article

“KAUMUDI FESTIVAL” THAT STARTED ON THE DAY AFTER DEEPAVALI BY WORSHIPPING MAHABALI, CULMINATED ON THE FULL MOON DAY OF KARTIKA.

In tune with the aim of the mission to restore the land of the Pandavas, Krishna started off after completing the worship of Bali, along with the Pandavas. Vyasa, who didn't utter a word without significance, seems to have thoughtfully employed the name “Kaumudi” for Kartika, reflecting the expectations of the Pandava clan on their completion of Kaumudi austerities. The date of the mission seems to have been planned in such a way that, Krishna would return with a positive news by the Full Moon day of Kartika. But he didn't!

The date of Peace Mission

Krishna started on Revati which occurs in the waxing phase of Kartika. Assuming that the Full Moon of Kartika occurred in the star Kritika, the tithi on Revati was likely to be Shukla Dwadasi. By Kartika Shukla Dwadasi, more than half of the Sharad season was over, prompting Vyasa to say that Krishna started at the end of Sharad season.

Body	Longitude	Nakshatra	P.
Lagna	25 Sc 59' 04.22"	Jye	3
Sun - GK	0 Sc 44' 22.12"	Visa	4
Moon - AmK	24 Pi 06' 32.50"	Reva	3
Mars - MK	21 Sc 37' 36.37"	Jye	2
Mercury (R) - BK	23 Li 25' 03.16"	Visa	2
Jupiter (R) - PK	7 Ta 08' 09.20"	Krit	4
Venus (R) - DK	0 Sg 03' 16.51"	Mool	1
Saturn - PiK	21 Cp 31' 01.85"	Srav	4
Rahu - AK	4 Le 25' 21.20"	Magh	2
Ketu	4 Aq 25' 21.20"	Dhan	4

Date:	August 25, -3136
Time:	8:00:00 am
Time Zone:	5:30:00 (East of GMT)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India
Lunar Yr-Mo:	Krodhi - Karthika
Tithi:	Sukla Dwadasi (Me) [Vijaya] (5.25% left)

Vedic Weekday:	Monday (Mo)
Nakshatra:	Revati (Me) (44.18% left)
Sunrise:	6:00:44 am
Sunset:	5:05:29 pm
Ayanamsa:	0-30-58.16

Figure 60: The date of Krishna leaving Upaplavya on peace mission.

When simulated in astrology software for Surya Siddhanta ayanamsa, the details matched exactly (Figure 60). The above simulation was for 8 AM in the morning when “**MAITRI**” Muhurta was running. The 3rd Muhurta since sunrise on any day is known as Maitri Muhurta. To know this muhurta we need the sunrise time of the day. It was 6 AM, and by adding 2 Muhurta duration of 96 minutes (48 + 48), the beginning of Maitri muhurta comes out to be 7-36 AM. The star Revati matches with **Shukla Dwadasi** derived conceptually. I have given the horoscopy chart too, to show the auspiciousness of the time chosen by Krishna and the Pandavas for this crucial mission. More importantly, I boxed in red the nodes that are

positioned at Leo and Aquarius to show that no single or double or triple eclipse could have occurred any time in Krittika or in the months before and after Krittika.

The positions of Rahu and Ketu are vital for eclipses.
 When the Sun and the Moon join them in close degrees, eclipse occurs.
 Here in the month of Kartika with the Sun having entered Scorpio,
 two signs away from Rahu,
 There is no chance for an eclipse in Kartika or any time close to it.

This is being emphasised here to educate the readers against the eclipse claims by some researchers of Mahabharata.

In any research, astronomy or astrology simulations must be resorted to as the last check-point to test the hypothesis the researcher had already established conceptually or mathematically. In the current discussion on seasons, we started from the basics of how the season was computed in Mahabharata calendar and checked with the season-based references in Mahabharata. This enabled us to arrive at certain time units which were cross-checked with the simulator to know whether our derivation is true or not. Our derivation is proved true.

Shall we now look at the problem with Nilesch Nilkanth Oak?

Nowhere in his book, has he done any analysis of any input on time given in Mahabharata in the light of traditional time keeping terms such as tithi, season, month etc. What we see is a complete chapter (Chapter 9) of 37 pages only on “**Conflicting observations**”!! These are not his observations, but those given in Mahabharata that he found conflicting with his own observations. He made out them to be the mistakes in Mahabharata! Where it suited him he called Vyasa’s words as ‘Shabda Pramāna’, but where it doesn’t, he changed it as per his requirement.

Krishna’s trip at the end of Sharad season is a conflicting reference according to Nilesch Nilkanth Oak. His methodology in such circumstances is to pick out what ‘corroborates’ with his simulation.

In the wake of not finding the corroboration for sharad season (for Krishna’s peace mission), Nilesch Oak picked out a reference to rainfall amidst ominous references for a calamitous

occurrence, at the time Krishna left Upaplavya, and characterises it as proof for Varsha season.

Proof against Varsha season proposed by Nilesh Oak for Krishna's peace mission.

The reference no 217 in his book⁴⁶⁹ pertains to the kind of ‘nimittas’ at the time of Krishna leaving Upaplavya. Janamejaya asked Vaisampayana about the omens seen at that time.⁴⁷⁰ Vaisampayana replied that auspicious omens were seen in the path of Krishna and where he stayed. In contrast devastation and unusual events happened at Hastinapur. To quote his words in Ganguli's translation,

*“Though there were no clouds in the sky, yet the roll of thunder accompanied by flashes of lightning was heard. And fleecy clouds in a clear sky rained incessantly in the rear! The seven large rivers including the Sindhu (Indus) though flowing eastwards then flowed in opposite directions. The very directions seemed to be reversed and nothing could be distinguished. Fires blazed up everywhere, O monarch, and the earth trembled repeatedly. The contents of wells and water-vessels by hundreds swelled up and ran out. The whole universe was enveloped in darkness. The atmosphere being filled with dust, neither the cardinal nor the subsidiary points of the horizon could, O king, be distinguished. Loud roars were heard in the sky without any being visible from whom these could emanate. This wonderful phenomenon, O king, was noticed all over the country. A **south-westerly wind**, with the harsh rattle of the thunder, uprooting trees by the thousands, crushed the city of Hastinapura. In those places, however, O Bharata, through which he of Vrishni's race passed, delicious breezes blew and everything became auspicious.”⁴⁷¹*

Nilesh Oak uses this description to mean that the season was Varsha. **Rainfall in Varsha season is not an omen, but rainfall in non-rainy (non-Varsha) season is an omen.**⁴⁷² All that is being described here are momentary events such as tremors accompanied with whirlwinds experienced at Hastinapur. Picking out the reference to **south westerly wind**,⁴⁷³ Nilesh Oak had come to the conclusion that south west monsoon was in progress at that time coinciding with the varsha season. But he spent no time to ponder over how the east flowing seven rivers of Sindhu could reverse the direction (to west), if the wind direction was from south west. The river flows don't get altered by the monsoonal winds and rains. A southwest flow of

⁴⁶⁹Mahabharata: 5- 82- 5 to 10 <http://www.sacred-texts.com/hin/mbs/mbs05082.htm>

⁴⁷⁰Mahabharata: 5-82- 3 <http://www.sacred-texts.com/hin/mbs/mbs05082.htm>

⁴⁷¹Mahabharata: 5-84 <http://www.sacred-texts.com/hin/m05/m05084.htm>

⁴⁷²Brihat Samhita: Ch 46- 38.

⁴⁷³“When Did The Mahabharata War Happen?” Page 152

wind pushes through northeast; how then could this change the direction of river currents from east to west? This is the strongest proof against rainfall from South west monsoon at that time, but this happens to be a positive proof for an asteroid hit that will be discussed in due course.

Unmindful of what the context says, Nilesch Oak has rejected the most explicit reference to ‘the end of the sharad season’ as the time of Krishna’s mission, and instead characterised an abnormal event of whirlwind and showers accompanied with tremors as corroborative evidence for Varsha season. These events reported for the first time in the narrative in a series of such events mark the beginning of a calamity originating from space.

Asteroid or comet impact during Krishna’s peace mission.

The events starting from the time Krishna left Upaplavya until his return are described in Mahabharata in three different view-points –as a general overview, from Sanjaya’s version given to Dhritarashtra and Krishna’s version to the Pandavas on his return. We have to combine all the three to construct the sequence of events. Perhaps this was Vyasa’s technique of keeping hidden the greatest secret of mankind on Time, getting altered cosmically. I have sequenced the odd events that point out to a cosmic impact.

At the time of Krishna leaving Upaplavya

At the time Krishna was travelling from Upaplavya to Salibhavana on the way to Hastinapur, ominous events occurred in the country of the Kurus, and also felt at Hastinapur. They were already written in the context of disproving Nilesch Oak’s claim that the season was Varsha. To find out the root cause of those events, they are listed down here.⁴⁷⁴

- Though there were no clouds in the sky, yet the roll of thunder accompanied by flashes of lightning was heard.
- Fleecy clouds in a clear sky rained incessantly in the rear!
- The seven large rivers including the Sindhu (Indus) though flowing eastwards then flowed in opposite direction.
- The very directions seemed to be reversed and nothing could be distinguished.
- Fires blazed up everywhere.
- The earth trembled repeatedly.
- The contents of wells and water-vessels by hundreds swelled up and ran out.
- The whole universe was enveloped in darkness.

⁴⁷⁴ Mahabharata: 5-50-84 (Ganguli’s translation) <https://www.sacred-texts.com/hin/m05/m05084.htm>

- The atmosphere being filled with dust, neither the cardinal nor the subsidiary points of the horizon could be ascertained.
- Loud roars were heard in the sky without any being visible from whom these could emanate. This phenomenon was noticed all over the country.
- A south-westerly wind, with the harsh rattle of the thunder, uprooting trees by the thousands, crushed the city of Hastinapura.

Thunderous noise from cloudless sky, rains in the absence of clouds, atmosphere filled with dust and sudden change in the direction of the river-flows and water from the wells and the vessels spilling out, can occur simultaneously in the event of an asteroid hit. **THE SOUTH WESTERLY WIND SUGGESTS THE TRAJECTORY OF THE ASTEROID FALLING FROM THE SOUTH WESTERN DIRECTION.** The jet of air dragged by the falling asteroid, while crossing the east flowing river, would obstruct the flow by which the water is pushed in the opposite (western) direction. Vyasa has indeed made a very meticulous observation of the changes in wind and water-flow. Figure 17 shows the south westerly winds caused by the falling asteroid blocking the water flow, by which the water started flowing in the opposite direction.

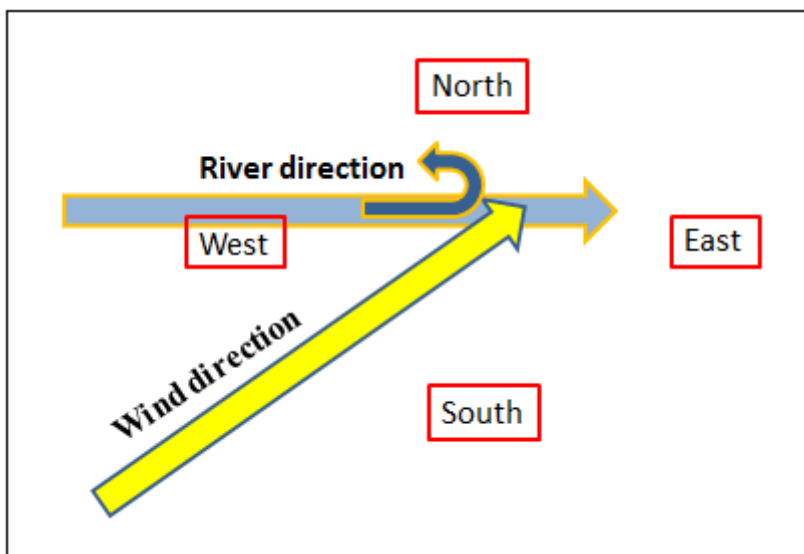


Figure 61: South-westerly wind blocking the east flowing rivers

This impact felt across a vast region from the river Sindhu to Ganga where Hastinapur is located, could not have been caused by single piece falling on the earth. The fact that this effect was not felt in the region travelled by Krishna on his way to Hastinapur goes to prove that there were several fragments falling from the south western direction in a vast region between the Sindhu and the Ganga where Hastinapur is situated. There was a rain of fragments, not just meteor showers, impacting the environment severely. Tremors and

whirlwinds are environmental effects of asteroid-hit due to increase in kinetic energy, according to a discussion in UCMP session.⁴⁷⁵ *If several such asteroids are falling on the earth, it could be the case of broken parts of a **LARGER ASTEROID** or a **COMET**.* The dust thrown into the air blurs the directions. The asteroid hitting the ocean would cause an increase in water vapour in the air that pours down as rains.

At the time of appointment of Bhishma as the Chief Commander

Similar calamities were seen again at the time Bhishma was installed as the Commander of the Kaurava troops. This appears in Krishna's narration to the Pandavas on his return. Though there is no explicit reference to the day of this installation, there are sufficient hints to deduce it. While Krishna was in the court of the Kurus seeking peace, Bhishma, Vidura, Drona, Gandhari and Dhritarashtra persuaded Duryodhana to give Pandavas their due share. Particularly when Dhritarashtra told Duryodhana that he was not the son of a king, due to the reason he (Dhritarashtra) didn't get the kingdom in normal course, Duryodhana's anger found no bounds. He called the fellow kings present there and said again and again that the day was **Pushya** and let them all march to Kurukshetra.

ajñāpayac ca rājñas tñ pāṛthivan duṣṭacetasaḥ
 prayādhvaṃ vai kurukṣetraṃ **puṣyo 'dyeti** punaḥ punaḥ
 tatas te pṛthivīpālāḥ prayayuh saha sainikāḥ
bhīṣmaṃ senāpatim kṛtvā saṃhr̥ṣṭāḥ kālacoditāḥ
 akṣauhiṇyo daśaikā ca pāṛthivānām samāgatāḥ
 tāsām pramukhato **bhīṣmas tālaketur** vyarocata⁴⁷⁶

(**Translation by Ganguli**) “And all the kings (invited by him), prepared to lay down their lives, followed him behind. King Duryodhana then repeatedly ordered those wicked-hearted rulers, saying, Today constellation **Pushya** is ascendant--march ye (this very day) to Kurukshetra. Impelled by Fate, those monarchs then, with their soldiers, gladly set out, making **Bhishma** their generalissimo. Eleven Akshauhinis of troops have been, O King, assembled for the Kauravas. At the head of that host, shineth Bhishma, with the device of the palmyra on the banner of his car.”⁴⁷⁷

⁴⁷⁵ “Examining the Potential Effects of an Asteroid Impact”
https://ucmp.berkeley.edu/education/dynamic/session5/sess5_asteroid.htm

⁴⁷⁶ Mahabharata: 5-5-148 – v. 3 -5

⁴⁷⁷ <https://www.sacred-texts.com/hin/m05/m05150.htm>

It is further said that after the night passed away (at day-break), Duryodhana arranged the army divisions.⁴⁷⁸ Bhishma was duly installed as the chief of the army. At that time some portents were seen. Vaisampayana reports,

prādurāsann anabhre ca varṣaṃ rudhirakardamam
 āsaṃś ca sarvayodhānāṃ pātayanto manāṃsy uta
 vācaś cāpy aśarīriṇyo divaś colkāḥ prapedire
 śivāś ca bhayavedinyo nedur dīptasvarā bhṛśam
 senāpatye yadā rājā gāṅgeyam abhiṣiktavān
 tadaitāny ugrarūpāṇi abhavañ śataśo nṛpa⁴⁷⁹

(Ganguli's translation): “And although the sky was cloudless, a bloody shower fell and made the ground miry. And fierce whirl-winds, and earthquakes, and roars of elephants, occurring, depressed the hearts of all the warriors. Incorporeal voices and flashes of meteoric falls were heard and seen in the welkin. And jackals, howling fiercely, foreboded great calamity. And, O monarch, these and a hundred other kinds of fierce portents made their appearance when the king installed Ganga's son in the command of his troops.”

*The earthquakes and whirlwinds when accompanied with meteorite showers are signs of a **COSMIC IMPACT**.* This happened on a Pushya day, though Duryodhana was heard telling “Pushyodyeti” the previous day. Pushya started on the night of the previous day and was present throughout the next day. The installation of Bhishma on that day was in tune with “Pushya Snana”, an age-old practice of taking ritual bath and conducting Vedic austerities for the prosperity of kings. Writing on this ritual, Varahamihira refers to the practice of the king dressing himself in military attire.⁴⁸⁰

An important feature of this ritual is noting down the omens at the end of the Homa for making predictions!⁴⁸¹ The portents turned out to be inauspicious, raising a doubt on the planned march to Kurukshetra on that day. The portents were the same as those witnessed on Revati day (the day Krishna started) eight days earlier.

The attack of a comet on Pushya day

The observation of meteorite attack at the time of installation of Bhishma as army chief on the Pushya day concurs with Vyasa's narration to Dhritarashtra later,

⁴⁷⁸ Mahabharata: 5-5-152. V:1

⁴⁷⁹ Mahabharata: 5-5-153. V: 28 -31

⁴⁸⁰ Brihat Samhita, translated by N.C.Iyer. Ch 48- 74

⁴⁸¹ Ibid, Ch 48- 78

“dhūmaketur mahāghoraḥ puṣyam ākramya tiṣṭhati”.⁴⁸²

The word Dhumaketu generally refers to a comet and it turns out to be so in this verse too, going by the description of portents after Bhishma was made the chief of the army. Similar *portents appearing eight days earlier* are very much in tune with a **COMET CAUGHT IN THE GRAVITATIONAL PULL OF THE EARTH-MOON SYSTEM AND COLLIDING WITH BOTH** in a series of *fragments after several rounds* around the earth and the moon together.

The moon taking the biggest hit, started moving faster, for only then, there can be a reduction in the tithis, seen in two phases. The change in the marks (features) on its surface is also indicative of a massive collision of a comet. The hit is similar to the crash of the comet Shoemaker-Levy on Jupiter, after being caught in the gravitational field of Jupiter in 1994, and breaking into several pieces and falling on Jupiter over a span of seven days with the biggest fragment falling on the 3rd day.⁴⁸³

At the time of Krishna leaving Hastinapur.

Similar portents were reported again on the day Krishna left Hastinapur, after talking to Kunti. Those portents were mentioned by Drona and Bhishma while trying to dissuade Duryodhana from fighting. They referred to the fall of blazing meteors blurring the sky and causing fear among animals and people.⁴⁸⁴ This had taken place on the day of Uttara Phalguni, known from the dialogue between Krishna and Karna before Krishna left.

These observations appearing from Revati to Uttara Phalguni, hint at a comet breaking into fragments and hitting the earth-moon system over a period of 13 days, with **THE BIGGEST PIECE FALLING ON THE MOON ON THE 9TH DAY WHEN THE MOON WAS CROSSING THE STAR PUSHYA**. The collision caused the moon to tremble on its path, by which it reached quickly the subsequent conjunction with the sun (Amawasya) and the opposition thereafter in 13 tithis each.

The date of that hit was already shown as **2ND SEPTEMBER IN THE YEAR 3136 BCE.**

The moon shaken by the bang appeared in the 7th phase, Saptami, while it should have been that of Shashti. In reality there could have been a difference of one or less than one tithi in the phase of the moon, but it caused Amawasya and Purnami to advance by 2 tithis each. In normal course the Amawasya must have occurred on Jyeshtha that Krishna hoped to see, but

⁴⁸² Mahabharata: 6-3-12

⁴⁸³ Comet Shoemaker-Levy 9 https://en.wikipedia.org/wiki/Comet_Shoemaker%E2%80%9393Levy_9

⁴⁸⁴ Mahabharata: 5-5-136. V: 20-22 <https://www.sacred-texts.com/hin/mbs/mbs05136.htm>

Karna pointed out the appearance of a different Karana (half of tithi) on Citra day that signalled Amavasya on Trayodasi (Fig 62)

Normal Star - Tithi -Karana

Star	Tithi	1st Karana	2nd Karana	Changed Tithi-Karana			
Pushya	Panca/Shash	Kaulava	Taitila	Pushya	Saptami	Bhadra	Bava
Aslesha	Shashti	Gara	Vanija	Aslesha	Ashtami	Balava	Kaulava
Magha	Saptami	Bhadra	Bava	Magha	Navami	Taitila	Gara
P.Phalguni	Ashtami	Balava	Kaulava	P.Phalguni	Dasami	Vanija	Bhadra
U.Phalguni	Navami	Taitila	Gara	U.Phalgur	Ekadasi	Bava	Balava
Hasta	Dasami	Vanija	Bhadra	Hasta	Dwadasi	Kaulava	Taitila
Chitra	Ekadasi	Bava	Balava	Chitra	Trayodasi	Gara	Vanija
Swati	Dwadasi	Kaulava	Taitila	Swati	Chaturdasi	Bhadra	Sakuni
Vishaka	Trayodasi	Gara	Vanija	Vishaka	Amavasya	Chatushpa	Nagava
Anuradha	Chaturdasi	Bhadra	Sakuni				
Jyeshtha	Amavasya	Chatushpad	Nagava				

Figure 62: Tithi- star alignment in normal course and after the comet-hit

Meteor showers were also reported in the subsequent days and even during the days of war, known from the observation of Drona on the 10th day of the war when Bhishma fell.⁴⁸⁵ This is indicative of the fall of debris over a period of time. This is more in tune with a comet fall than an asteroid hit.

Scientific evidence for a comet hit in 3136 BCE.

A **cosmic collision** simultaneously on the earth and the moon has a **probability ratio of 23:1**.⁴⁸⁶

In the 3136 BCE collision, the impact region was on the lower half of the moon that was visible during the second half of the waning phase. A powerful impact throws up the lunar soil and scatters it over a vast area. This causes changes in the marks on the face of the moon, at least temporarily – until the dust settles down. It appears Karna and Vyasa referred to this changed appearance caused by the bang on a Pushya day.

⁴⁸⁵ Mahabharata: 6-108-9 <https://www.sacred-texts.com/hin/mbs/mbs06108.htm>

⁴⁸⁶ Terada et al., “Asteroid shower on the Earth-Moon system immediately before the Cryogenian period revealed by KAGUYA”, Nature Communications, p.6



Figure 63: Features of the waning moon seen on Shashti tithi

The waning phase of Shashti is shown in Figure 63 to know the appearance of the marks that are normally seen on the lunar disc. The dark patches are volcanic ‘seas’ that were formed during the early period of the formation of the moon. They have always remained the same. Any collision in that part is not detectable, but a powerful collision in the blank region on the right side of the disc in Figure 63, could create temporary marks formed by the scattered soil. That can be seen as fresh patches on the face of the moon in the immediate aftermath of the collision. The same statement made by Karna and Vyasa - **“SOMASYA LAKSMA VYĀVRTTAM”** (“The mark (sign) of the moon became separated or parted with”) goes to prove that the two had seen some fresh marks on the lunar disc on the night of Pushya.

Once the surface became calm, the fresh marks would no longer appear but the impact site would remain as a crater. There are numerous impact craters on the moon, but only two prominent ones are found in the blank part of the moon of the waning Shashti, giving us an idea about where the comet-piece could have fallen. Figure 64 shows the two craters, Albategnius and Moretus outside the visible features of this part of the lunar disc. The middle picture shows how the waning moon appears at rising on Shashti tithi from South India. (Almost the same as how it appears for an observer in Hastinapur) The impact caused the lighted area of Shashti reduced into Saptami.



Figure 64: Location of two prominent craters⁴⁸⁷

The crater on the left, Albategnius is 131 km wide with its outer wall heavily eroded with impacts, valleys and landslips, indicating many subsequent impacts after its formation. This is noticed in very old impact craters. In contrast, the 114 km wide Moretus, the crater on the right in Figure 64, is without such features barring a very few impacts, thereby indicating its recent origin. For comparison the close-up view of the two craters is produced in Figure 65.

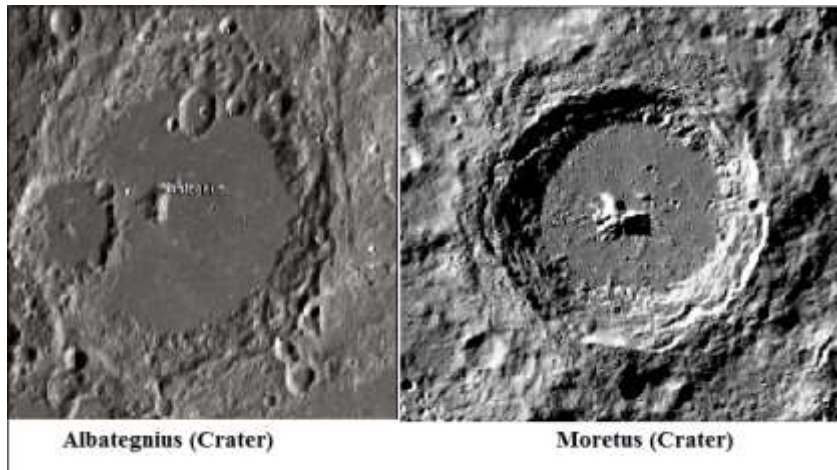


Figure 65: Comparison of the two impact craters on the moon

The locations of the two craters are marked in Figure 66 to show the probable regions of scattered lunar soil that could be visible as fresh signs on the lunar disc. These locations depict the exact meaning of the verse “SOMASYA..” of the mark or the sign on the disc getting separated from the huge prominent feature occupying most part of the disc. When a single distinct mark appears on the blank region it was perceived as though the major feature got divided (vyāvṛttam).

⁴⁸⁷ Picture sources from left to right:

https://en.wikipedia.org/wiki/Lunar_craters#/media/File:Location_of_albategnius_crater.jpg , @bharanivt,
https://en.wikipedia.org/wiki/List_of_craters_on_the_Moon#/media/File:Location_of_lunar_crater_moretus.jpg



Figure 66: Probable locations of the two craters on the lunar disc.

Of the two, the scattered soil around the location of Moretus is easily distinguishable for the earth-bound naked eye observer, as newly formed marks on the face of the waning moon. Such an appearance is re-created in Figure 67.

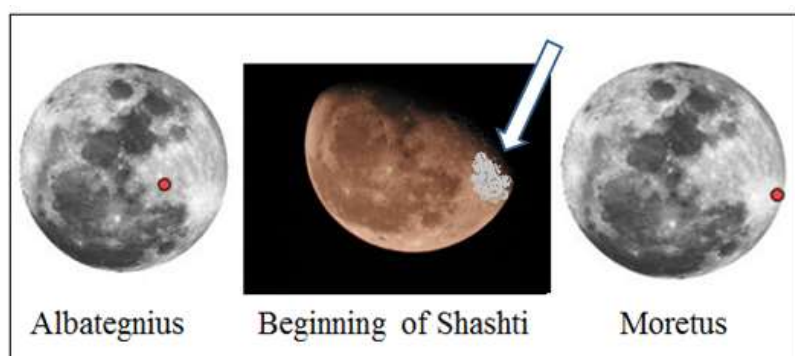


Figure 67: Probable location of the fresh marks seen by Karna and Vyasa.

Moretus crater was widely studied and rated as ‘young’ - though this means millions of years old. Some of the features of this crater match with the impact hinted in Mahabharata. A study by **Ivanov et al** for choice of the carter for landing purpose says, “*The excavation depth of Moretus impact exceeds the total thickness of ejecta of all lunar basins, regardless of the model applied.*”⁴⁸⁸ This means the impacting fragment had penetrated deeper and caused massive displacement of lunar material that can be seen as fresh marks on the face of the moon. This crater has a chain of secondary craters, hinting at fragmentary fall of a comet. The impact that caused the moon to alter its speed and path could not have been an average one.

There is a likelihood of some other crater being the impacted region of the comet fall; however such region must be in the feature-less space of the lunar disc shown in Figure 63, to have become visible from the earth.

⁴⁸⁸ Ivanov et al, (2018) “Geological characterization of the three high-priority landing sites for the Luna-Glob mission”, Planetary and Space science, p.195

The Pushya day events corroborate a simultaneous fall of the fragments on the earth and the moon. The collision has occurred at sunset time in Hastinapur that experienced a shower of fragments while the major chunk had fallen somewhere in Europe. (All these were written in detail in the last chapter) Around that time four odd events were reported – all traced to a change in the atmospheric refractive index caused by the comet-hit. The Arundhati observation was one among them.

The moon must have received the hit, around the same time. Figure 68 maps the position of the moon in Pushya and Rahu in Magha at sunset time in Hastinapur (H). The directions are with reference to the earth. The cemetery fragments had come from the south western direction. Just before midnight, the battered moon started appearing in Hastinapur, with fresh marks on its disc. The expected shape of Shashti phase was found changed into Saptami Phase –its impact on tithi – karana – star, meticulously noted by **Karna**.

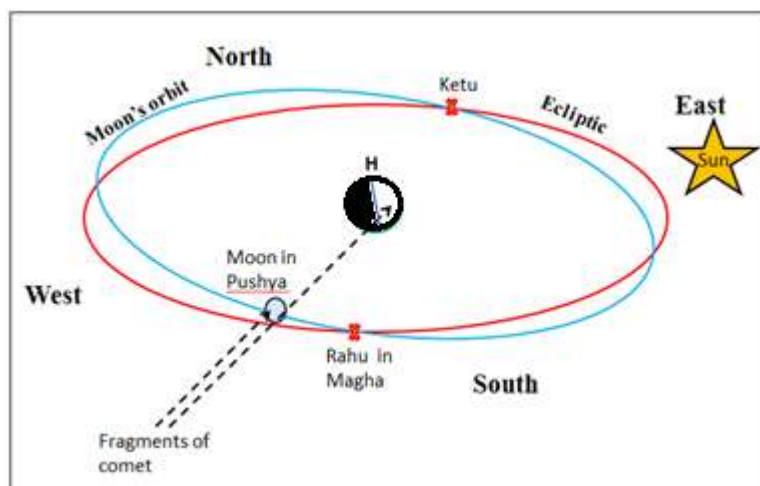


Figure 68: The incidence of a comet-fall on the earth and the moon on Sep 2, 3136 BCE

For the first ever time in recorded history Time changed by a tithi and two phases ended in Trayodasi. Most of the astronomy observations of Mahabharata were expressed only in the aftermath of the comet-hit that caused great fear among the people. The odd looking observations can be explained only in the context of the comet-hit.

Vyasa refers to loss of Tithi twice but not twin eclipses.

The phase that had seen the comet hit, ended up on Trayodasi when Amawasya occurred in Vishakha, instead of Jyeshtha. This is judged from the fact that Krishna originally expected

Amawasya in Jyeshtha.⁴⁸⁹ Two tithis short of that indicates Vishakha as the star of the day, when no-moon occurred on Trayodasi. A shocked Vyasa expressed,

caturdaśīm pañcadaśīm bhūtapūrvām ca ṣoḍaśīm
imām tu nābhijānāmi amāvāsyām trayodaśīm⁴⁹⁰

Meaning:

caturdaśīm = caturdaśī (ī-stem, singular, accusative)

pañcadaśīm = pañcadaśī (ī-stem, singular, accusative)

bhūta = actually happened, true, real (n. an actual occurrence, fact, matter of fact, reality)

pūrvām = formerly (ā-stem, singular, accusative)

ca = and, also, moreover

ṣoḍaśīm = ṣoḍaśī (ī-stem, singular, accusative)

imām = this

tu = but

na abhijānāmi = I have never known (I could not realize even until now : SB: 9-19-12)

amāvāsyām = the sun and moon "dwell together" (ā-stem, singular, accusative)

trayodaśīm = trayodaśī (ī-stem, singular, accusative)

Overall meaning:

“This (Amawasya) in Caturdasi, Pancadasi and also formerly happened in Sodasi, but I have not known until now Amawasya in Trayodasi.”

There is absolutely no reference to an eclipse in this verse. Vyasa spoke about a never- heard, a never-happened-before event of the Amawasya occurring in Trayodasi.

To know why it is a never-happened before event, we must know what Caturdasi, Pancadasi etc. are. They are Tithi-s of the lunar time scale each of them covering exactly 12 degree span of the sky in the lunar orbit. They are not days, that are reckoned from sunrise. Pancadasi (15th tithi) is the median around which Amawasya or Purnami occurs. Sometimes Amawasya starts after Caturdasi (14th tithi) had started but never before Caturdasi, in which case it would mean Trayodasi (13th tithi). Similarly it could stretch a little forward of

⁴⁸⁹ Mahabharata: 5-140-18

⁴⁹⁰ Mahabharata: 6-3-28

Pancadasi (15th tithi) touching Shodasi (16th tithi) but never go to Saptadasi, the 17th tithi. The sway occurs between 14th to 16th tithi with the 15th tithi as the median.

The drift can happen gradually over millions of years to either the 13th or the 17th tithi, due to a gradual change in the speed of the moon but not suddenly. If ever it goes to the 13th or the 17th tithi suddenly it is an indication of some calamity affecting the path and the speed of the moon. This basic scientific knowledge about the moon is essential for understanding this verse of Mahabharata!!

Nilesh Oak offers another version which reads,

“Chaturdashi panchadashi **kadachidapi** shodasim, imam tu nabhijanami **bhutaPurva** trayodashim”⁴⁹¹

This makes no difference from the previously quoted verse. The word **kadachidapi** that he had given in bold letters is a combination of kadacit and api.

Kadacit = once upon a time (SB 3.12.34), on one occasion (SB 10.34.20)

Api = also.

Kadachidapi = once in a while also, sometimes too

kadachidapi shodasim = Once in a while in Shodasi (Amawasya occurs)

Similarly the word “**BhutaPurva**” (already explained in “bhūtapūrvām ca ṣoḍaśīm”) refers to ‘formerly happened’ or ‘earlier happened’.

But it is said, “nabhijanami bhutaPurva trayodashim” which means “I have never known that it happened in Trayodasi in earlier times.”

So the meaning is “*Caturdasi, Pancadasi and sometimes in Sodasi too, but I have never known (Amawasya) in Trayodasi in the earlier times.*”

Nilesh Oak says that this refers to the “time interval of 13 days”, and not referring to Amawasya, “but rather to the time interval between the lunar and solar eclipses”⁴⁹² The ‘time interval of 13 days’ refers to a phase having Amawasya at one end and Purnami at another end, but he prefers to ignore “nābhijānāmi amāvāsyām trayodaśīm” found in all the versions

⁴⁹¹ “When did the Mahabharata War Happen?” p. 101

⁴⁹² Ibid.

as it upsets his Voyager- Simulator Nyaya, that shows him two eclipses separated by thirteen days.

Thirteen day eclipse – single or twin or triple eclipses are a fad among almost all the Mahabharata researchers. Starting from Dr.S.Balakrishna, most Mahabharata researchers have been harping on the ‘thirteenth day’ eclipse, not knowing that Vyasa doesn’t talk about day but only about tithi and has not mentioned *apasavyam* graha (the anti-clockwise moving planet that always refers to Rahu or Ketu) but only ‘*aparvaṇi* *grahāv etau*’ – of two grahas joining in out of season. Vyasa says this in the next verse.

candrasūryāv ubhau grastāv ekamāse trayodaśīm
aparvaṇi grahāv etau prajāḥ saṁkṣapayīṣyataḥ⁴⁹³

Meaning:

Candrasūryāv = Moon and sun (dual, nominative, vocative, accusative)

Ubhau = both of them, against each other, i.e. opposite to each other (SB 10.63.23) (dual, nominative, vocative, accusative)

Grastāv = covered (SB 6.8.34: sva-tejasā grasta-samasta-tejāḥ sva-tejasā = by His personal effulgence covered all other influences = one upon another) (dual) stem: grasta. (Nominative, accusative, dual past passive participle)

ekamāse = in a month (locative)

trayodaśīm = trayodaśīm = trayodaśī (ī-stem, singular, accusative)

aparvaṇi = (locative case of a-parvan-) at the wrong time, out of season

grahāv = two grahas (moon and sun), (dual, nominative, vocative, accusative)

etau = these two (SB 10.41.31), these (SB 10.43.23, SB 10.46.31, SB 10.82.38, SB 11.11.6, SB 3.16.2)

prajāḥ = people

saṁkṣapayīṣyataḥ = will be destroyed

Overall mining:

“These two grahas, the moon and the sun covered each other (Full-moon) at a wrong time in Trayodasi in a month, (by which) the people are to be destroyed.”

⁴⁹³ Mahabharata: 6-3-29

In the first line candrasūryāv, ubhau and grastāv’ are in dual case indicating the catching of only two planets, the moon and the sun. Since this followed Amawasya in Trayodasi in the previous verse, the meaning “against each other” referring to “opposite to each other” (Full-moon) is taken for ‘ubhau’. The event being that of Full-moon, the meaning ‘covered’ is taken for ‘grastav’ (dual declension). They covered each other at wrong time (aparvani), a reference to Trayodasi –i.e. before the normal season on Pancadasi or even Caturdasi. This happened in ekamāse – in a month or in one month – which could be a reference to a solar month or two pakshas (phases of the moon) together, but can never be in a single lunar month, because by Amawasya, a lunar month ends and the next month starts from the next day. In that month the Full Moon had happened at Trayodasi.

Thus there is absolutely no reference to an eclipse in this verse too. The word ‘grasta’ is misinterpreted by some researchers to mean, Rahu!!! Grasta can happen with or by any one. To have meant an eclipse, the verse should have made a mention about Rahu or Ketu by their alternative names⁴⁹⁴ if not in their own names and used plural declension. It is repeatedly written in dual declension about the sun and the moon and what they did with each other.

The Amawasya in Trayodasi had occurred in the lunar month of Kartika (Kaumudi) in the star Vishakha and not in Jyeshtha. The simulated version from the astrology software for Surya Siddhanta ayanamsa (Figure 69) shows Vishakha starting in the evening of Krishna Trayodasi of Kartika month that ushered in the concept of Bodhayana Amawasya. Note the location of Rahu more than 90 degrees away from the sun. In the absence of a conjunction with Rahu or Ketu, an eclipse cannot occur.

Body	Longitude	Nakshatra	Pada				
Lagna	1 Ge 36' 23.13"	Mrig	3		GL	(Ju)	As
Sun - PK	17 Sc 23' 08.60"	Jye	1	PP	AL		
Moon - PiK	21 Li 50' 18.30"	Visa	1	UL	AS		
Mars - DK	3 Sg 36' 00.04"	Mool	2				
Mercury - AK	27 Li 07' 28.31"	Visa	3				
Jupiter (R) - GK	4 Ta 54' 14.61"	Krit	3				
Venus (R) - BK	24 Sc 54' 40.79"	Jye	3				
Saturn - MK	22 Cp 33' 21.89"	Srav	4				
Rahu - AmK	3 Le 33' 13.85"	Magh	2				
Ketu	3 Aq 33' 13.85"	Dhan	4				

Date:	September 10, -3136	Tithi:	Krishna Trayodasi
Time:	5:30:00 pm		(12.89% left)
Time Zone:	5:30:00 (East of GMT)	Vedic Weekday:	Wednesday (Me)
Place:	78 E 01' 00", 29 N 10' 00"	Nakshatra:	Visakha (Ju)
	Hastinapur, India	Sunrise:	6:01:16 am
		Sunset:	4:40:37 pm
Lunar Yr-Mo:	Krodhi - Karthika	Ayanamsa:	0-30-55.73

Figure 69: Amawasya on Trayodasi in the star Vishakha

⁴⁹⁴ Rahu’s other names are Tamas, Agu and Asura. For Ketu, Shiki. “Brihat Jataka”: 2-3

Bodhayana Amawasya tarpan done by Krishna

The popular legend of Krishna starting to do **Pitru Tarpan** by inviting the sun and the moon earlier than normal, happened on this day. As explained in chapter 10, when Amawasya starts on the previous evening and ends before sunset the next day, the previous day (Caturdasi) is treated as Amawasya, as per Bodhayana Sutra. The rationale is that since Amawasya means conjunction of the sun and the moon, Amawasya tithi must be running at night time, though the tithi is recognised at sunrise. On 10th September 3136 BCE, Amawasya must have started by the evening of Trayodasi when Vishakha also started. Though it was there on 11th morning, it must have ended before sunset. No software, no manual calculation can establish this. This is deduced from the events revealed by the verses.

In normal course one can do the tarpan on 11th noon, but Amawasya starting on the day of Trayodasi made that an exceptional event, that Krishna started doing the tarpan as soon as Amawasya started. From then onwards (as per tradition), Amawasya on the previous day (Caturdasi) that doesn't see to the next night came to be regarded as Bodhayana Amawasya.

This kind of Amawasya span occurs in normal course three or more times in a year, but it was *not treated as the time for tarpan ceremony until Krishna started doing the tarpan on the most extraordinary time of Amawasya occurring on Trayodasi.* This is deduced from the tradition of Bodhayana Amawasya tarpan having been initiated by Krishna.

From the simulation shown above, it is known that there is absolutely no scope for an eclipse on that day. The fundamental rule for a solar eclipse being the conjunction of Rahu or Ketu with the sun and the moon was non-existent on that day. Rahu was away from the Sun by more than 90 degrees.

The second Trayodasi Purnami repeated in Vyasa's version.

The connection between the sun and the moon occurred on Trayodasi twice, first as Amawasya in the 13th tithi and then as Purnami in the 13th tithi of that phase. The second is deduced from another verse also. Let me explain that deduction.

The Margashira month started on the next day of the Amawasya (on waning Trayodasi). In the normal course, the Full-moon of this month would occur in the star Mrigashira, but that would be the 16th tithi, when counted from Vishakha, whereas Vyasa noted specifically that the phase ended in the star Kritika! Normally, Full-moon would occur in Kritika or close to Kritika in the month of Kartika. Krishna started two days before the Full-moon in Kritika in Kartika month. That Full-moon was event-free. The major event of the comet fall happened

four days after that Full-moon. So any reference to an affliction related to the Full-moon in the star Kritika was not about the Full-moon day of Kartika month. With this clarity let us read the statement by Vyasa.

ahorātram mayā dṛṣṭam tat kṣayāya bhaviṣyati
 alakṣyaḥ prabhayā hīnaḥ paurṇamāsīm ca kārṭtikīm
 candro 'bhūd agnivarṇaś ca samavarṇe nabhastale ⁴⁹⁵

Meaning:

ahorātram = day and night, continually (dual number, neuter, vocative, singular, stem: ahorātra)

mayā = by me (deictic instrumentative, singular, stem: asmad)

dṛṣṭam = is seen (SB 5.10.11), seen (SB 1.12.30), being seen, personally seen

tat = there, in that place (neuter, nominative, accusative, singular, stem: tad)

kṣayāya = for destruction (BG 16.9, SB 4.29.22), for the sake of diminishing (SB 2.7.22), diminution, decay, loss (dative, singular, stem: kṣaya)

bhaviṣyati = it will be (SB 11.7.4), will appear (SB 2.7.38) (locative, singular, future participle, stem: bhaviṣyat)

alakṣyaḥ = no particular marks (stem: lakṣyaḥ meaning mark), insignificant appearance.

Prabhayā = with its light (SB 10.51.29) (feminine, instrumentative, singular, stem: prabha)

hīnaḥ = bereft of (SB 4.14.39-40) (nominative, singular, past passive participle, stem: hīna)

paurṇamāsīm = Full moon (ī-stem, singular, accusative)

ca = and, also, moreover

kārṭtikīm = Full-moon in the constellation of Kritika, Full-moon in the month of Kartika (ī-stem, singular, accusative)

candro 'bhūd = candra (moon) abhūt = Root verb: bhū, appeared (SB 10.19.7, SB 9.24.12) (third person, singular, tense paradigm aorist class, parasmaipada)

agnivarṇaś = having the colour of fire

ca = and, also, moreover

⁴⁹⁵ Mahabharata: 6-2. V.22-23

samavarṇe = of the same colour (singular, locative)

nabhastale = sky surface, firmament (neuter, locative, singular)

Overall meaning:

Day and night seen by me that the diminution will be happening; also in the firmament Full-Moon in Krittika without marks and bereft of light, appeared in the same colour, in the colour of fire.

This verse is misinterpreted by almost all the Mahabharata researchers as indicative of a lunar eclipse in 13 days! In support of this, they show ‘Kshaya’, “Prabhaya hina” and “agnivarna”!

The first point against the lunar eclipse is that it was seen by Vyasa ‘*day and night*’. Can the lunar eclipse that was going to happen in future (bhavishyati) be seen beforehand for day and night continuously?

The second point *is how the Full-moon could occur in the star Krittika*? Only the star is mentioned here, not the month. The Kartika month was already gone at the time Krishna left two days prior to the Full moon in Kartika. There was no eclipse at that time. But this Full-moon had occurred in Margashira, after the Amawasya in Trayodasi. So there is something wrong with it appearing in Krittika, the star. This is asambhavam – impossible, but it seemed it was going to happen; that is why Vyasa kept watching day by night.

The third point is *against linking the term ‘Kshaya’ with eclipse* (reduction in lighted surface during the lunar eclipse). ‘Kshaya’ refers to the tithi. Day and night Vyasa was observing the tithis, finding them diminishing (kshaya) by which the Full Moon would appear ‘out of season’- expressed in another verse (explained earlier).

To understand this one must know how tithis extend or reduce in a phase. A ‘kshaya tithi’ is that which starts after the sunrise and ends before the sunrise next day – by which that tithi is lost in counting. To give an example, suppose the tithi at sunrise is Dwitīya, then the tithi of the day is taken as Dwitīya only. Sometime after sunrise, Tritiya arrives but may get ended before the next sunrise when Caturthi has already started. By this the previous day had Dwitīya and the next day has Caturthi, and in between Tritiya is dropped from counting. Tritiya in this case is known as Kshaya tithi.

This phenomenon of **kshaya tithi** occurs due to variation in the speed of the moon. It would be faster at perihelion, by which a tithi (12 degree) gets ended between two sun rises. By this, three tithis are seen within two sunrises. Similar to the Kshaya masa event the Kshaya tithi

would be followed or preceded by an extended tithi, known as **Tri-dina spruk** that stretches beyond two sun rises. This occurs when the moon is at aphelion. Within a month the moon crosses both the perigee and apogee in its orbit around the earth by which the Kshaya tithi and Tri-dina spruk occur in succession. At times Kshaya tithi is accompanied with Tithi-dvayam by which two tithis appear with in two sunrises. But whenever a Kshaya tithi occurs, either a Tithi-dvayam or a Tri-dina spruk is certain to occur a few days before or after the Kshaya tithi, in the same paksha (phase of the moon).

Particularly after Bodhayana Amawasya, which by itself is a case of early occurrence of a tithi, not matching with day and night, an extended tithi would occur within Pancami (the first 5 tithis). Strangely Vyasa was seeing only Kshaya tithis and no automatic adjustment by way of extended tithis. This means the moon was faster than normal.

This gives us the revelation that the 13th tithi Amawasya occurred because of faster than normal movement of the moon, caused by the comet-hit. That it continued in the next phase is made out from the expression, “*tat kṣayāya bhaviṣyati*” which was seen by Vyasa day and night.

The fourth point against the suggestion of an eclipse is about “*alakṣyaḥ prabhayā hīnaḥ*”. Taking the meaning of ‘alakshya’ as ‘invisible’, the Mahabharata researchers thought that it referred to an eclipse as there was a ‘reduction in the moonlight’ (prabhayā hīnaḥ). Alakshaya is the opposite of Lakshaya with one of the meanings, “**mark**”. Alaskya means without marks.

Here we must recall Vyasa’s verse on “*Somasya lakshma vyavrittam*” where he meant seeing changes in the marks on the lunar disc. So naturally he was expected to look intently at the waxing moon for the fresh marks that he had seen days ago. To his dismay no marks were seen anywhere on the moon. Then what did he see? He explains it in the next line, “*candro ’bhūd agnivarṇa*” - the moon appeared in the colour of fire. Additionally, the increase in brightness day after day expected in the waxing phase was no longer happening. The lunar disc appeared entirely devoid of marks and bereft of light.

The three-lines perfectly express the dull appearance of the lunar disc that was recovering from a comet-hit. Even the normally appearing features were not seen as the disc appeared dull with red – made so by the catastrophic collision on its soil. The impact must have been phenomenal with the disturbed lunar soil not yet settled down in the next 20 days that Vyasa was watching. And strangely the Full-moon occurred in the same star of the previous month!

The simulated horoscopy (Figure 70) shows Krittika joining Trayodasi, but that was Purnami day at that time.

Body	Longitude	Nakshatra	Pada
Lagna	18 Ge 14' 20.37"	Ardr	4
Sun - DK	1 Sg 40' 03.69"	Mool	1
Moon - PK	6 Ta 08' 22.22"	Krit	3
Mars - PiK	14 Sg 02' 26.95"	PSha	1
Mercury - MK	14 Sc 59' 51.70"	Anu	4
Jupiter (R) - GK	3 Ta 11' 51.99"	Krit	2
Venus (R) - BK	16 Sc 35' 53.93"	Anu	4
Saturn - AmK	23 Cp 44' 05.58"	Dhan	1
Rahu - AK	2 Le 48' 43.88"	Magh	1
Ketu	2 Aq 48' 43.88"	Dhan	3
Date: September 24, -3136			
Time: 5:30:00 pm			
Time Zone: 5:30:00 (East of GMT)			
Place: 78 E 01' 00", 29 N 10' 00"			
Hastinapur, India			
Lunar Yr-Mo: Krodhi - Margasira			
Tithi: Shukla Trayodasi (Ju) [Sarva Mangala]			
(12.73% left)			
Vedic Weekday: Wednesday (Me)			
Nakshatra: Krittika (Su)			
(28.95% left)			
Sunrise: 6:04:41 am			
Sunset: 4:25:56 pm			
Ayanamsa: 0-30-53.66			

Figure 70: The second Trayodasi phase of the moon

Trayodasi in this simulation is counted in normal course as no simulator can show the loss of tithis at that time. There must have been minimum two kshaya tithis without any extended tithi in that phase, bringing Purnami on a tithi which would in normal count be Trayodasi. This is ascertained from the difference of four tithis at the start of Uttarayana the next year, from Shukla Trayodasi to Shukla Ashtami, explained earlier in this chapter.

Another feature deduced from Figures 69 and 70 is that the two anomalies were likely to have occurred within a **solar month (ekamāse)**. The 13th tithi Amawasya occurred when the sun was in 17/ 18th degree of Scorpio. The next 13th tithi event (Full-moon) could have started at the time of solar ingress into the next sign (Sagittarius). Figure 70 is simulated for a time when Trayodasi was in the last one-seventh part and Krittika in the last one-third part. If Full Moon started at the beginning of the tithi (Trayodasi) and the star, then the sun would have

been at the junction between the two signs, which makes the two events happening in a single month of the sun.

THE OCCURRENCE OF THE FULL-MOON IN THE SAME STAR (KRITTIKA) CONSECUTIVELY FOR TWO MONTHS (IN KARTIKA AND MARGASHIRA) IS PROOF OF THE LOSS OF A COMPLETE MONTH- A KIND OF KSHAYA MASA. This has to get adjusted by an adhika masa after this, if the moon was recovering from the shock of the collision. Bhishma busy with the war preparations obviously did not keep track of the change in time – in the lunar tithis. As a result he failed to foresee the piling up of days leading to an Adhika Masa at the most inappropriate time of Magha and prepared to lay down his life much earlier than the delayed arrival of Uttarayana! **THE SEQUENCE THAT IS EXPLAINED TILL NOW JUSTIFIES AN ADHIKA MASA APPEARING AT MAGHA!** Without a grasp of these events, it is not possible to get the Mahabharata date right.

In the final analysis, Vyasa's reference to Amawasya in Trayodasi in Kartika month followed by Purnami in Krittika in Margashira month is proof of an **anomaly in the moon's speed** which however returned to normal by the next phase. The temporary glitch in the lunar cycle finds an explanation only in the comet hit hinted by Mahabharata. *This written record pointing to a comet hit on the moon and the subsequent observations are the first of its kind* in the world, and it must be brought to the notice of the world. It establishes the accuracy of Mahabharata and the well advanced Indic culture present as early as 5000 years ago.

Sequence of Mahabharata events after the exile.

- The sequence in terms of months, tithi and nakshatra of the respective months would solve many problems and confusions in understanding the verses. The importance of this is highlighted from the fact that Nilesh Oak uses the Mahabharata references indiscriminately without checking the context of the months. To give an example, he says that both armies (of Kauravas and Pandavas) left for Kuruskhetra on Pushya,⁴⁹⁶ while in reality they left on Pushya of different months. Therefore a systematic listing of events in respective months is done below to arrive at the correct date of the events.

1. Lunar Ashadha month: (Sun in Cancer)

- Exile ended on Krishna Dasami.
- With 5 days left for the month to end, developing acquaintances and discussions must have happened.

⁴⁹⁶“When Did The Mahabharata War Happen?” Page 117

- Proposal for marriage of Uttara, the daughter of King Virata, with Abhimanyu.

2. Lunar Shravana month: (Sun in Leo)

- Marriage of Abhimanyu conducted.
- After the marriage, intense discussion on ways to get back the kingdom from the Kauravas.
- Krishna and Balarama returned to Dwaraka.

3. Lunar Bhadrapada month: (Sun in Virgo)

- Pandavas began preparations for war.
- Both Arjuna and Duryodhana went to Dwaraka seeking support of Krishna for the war.⁴⁹⁷ (It is probable that this happened in the previous month.)
- After getting assurance from Krishna to send army to support his side, Duryodhana went on to meet Balarama. Balarama refused to side with anyone, and expressed his inability to act against Krishna.
- Emissary of King Drupada was sent on a peace mission to Kuru kingdom on Pushya day.⁴⁹⁸ This was in waning phase (Krishna Paksha) of Bhadrapada.

4. Lunar Ashvayuja month: (Sun in Libra)

- The peace mission of Drupada's emissary sent on Pushya day failed.
- This was followed by Sanjaya's peace mission to Pandavas. This also failed. There is no reference to any Panchanga feature to locate this.

5. Lunar Kartika month: (Sun in Scorpio)

- Krishna started on the peace mission to Hastinapur in the star Revati. Tremors and whirlwinds struck Hastinapur while Krishna was on the way.
- During the presence of Krishna on the peace mission in the court of Dhritarashtra, Duryodhana ordered the moving of troops as the day was Pushya. He kept repeating that the troops be moved to Kuruskheta, the day being Pushya!⁴⁹⁹
- From Brihat Samhita it is known that Pushya star has an important place in the activities of kings.⁵⁰⁰ Pushya Bath and Homa were done and Bhishma was installed as the chief of the army of the Kauravas.
- Terrible nimittas which in reality were the collision effects of a comet were noticed on the evening of the Pushya day. All these were discussed earlier in this chapter.
- After the failure of the peace mission, Krishna left the court of Dhritarashtra.

⁴⁹⁷Mahabharata: 5-7 <http://www.sacred-texts.com/hin/m05/m05007.htm>

⁴⁹⁸Mahabharata: 5-6 <http://www.sacred-texts.com/hin/m05/m05005.htm>

⁴⁹⁹ Mahabharata: 5-148-3 <http://www.sacred-texts.com/hin/mbs/mbs05148.htm>

⁵⁰⁰Brihat Samhita: Ch 48

- On the 4th day after that (Uttara Phalguni), Krishna left for Upaplavya, but before that he took Karna in his chariot to tell him his birth secret. Karna turned a bit emotional and somewhat repentant in his conversation with Krishna, but was not willing to leave Duryodhana.
- When Krishna could not succeed in persuading him to switch over sides he advised him to tell Drona, Bhishma and Kripa to get ready for the upcoming war and worship Indra on Jyeshtha Amawasya that was to appear in 7 days.
- This is a crucial verse that decides the dates of events that followed.⁵⁰¹
saptamāc cāpi divasād **amāvāsyā** bhaviṣyati

saṃgrāmaṃ **yojayet** tatra tāṃ hy āhuḥ **śakra devatām**

(**Translation by Ganguli:** Seven days after, will be the day of the new moon. Let the battle commence then, for that day, it hath been said, is presided over by Indra.)

Indra, the lord of Devas was worshiped for victory in war and this was done by means of a homa to Indra's banner.⁵⁰² Since Jyeshtha was ruled by Indra, Krishna told Karna to get ready for the war worship Indra on Jyeshtha and get ready for the war (yuddhāyābhyupāgatāḥ). This holds good for both armies and any king who was planning to join this war. The larger issue is something else.

Why did Krishna suggest war preparations to begin on Jyeshtha Amawasya, when Duryodhana had already started to march his army on the Pushya Day, three days before this conversation?

The hidden information is that Duryodhana, in spite of repeated talk of moving the army on the Pushya day, did not move his army on that day due to inauspicious nimittas caused by the comet-hit. Krishna had suggested Jyeshtha Amawasya as an alternate day for starting the war plan and marching the army.

Jyeshtha Amawasya was zeroed in by Vartak as the start of the Mahabharata war, but Nilesh Oak chose to deviate from him due to the impracticality of war preparations within 7 days by the Pandavas. As if to assign a date for a fiction story, Nilesh Nilkanth Oak pushed the date of war by a month and 7 days⁵⁰³ – within which he was able to 'accommodate' Balarama's tirtha yatra – and add an 'adhika masa' in that one month⁵⁰⁴

- Krishna's suggestion regarding Jyeshtha Amawasya establishes that Duryodhana did not start as planned on the Pushya day.

⁵⁰¹ Mahabharata: 5-140- 18 to 20 <http://www.sacred-texts.com/hin/mbs/mbs05140.htm>

⁵⁰² Brihat Samhita: Chapter 43

⁵⁰³ "When Did The Mahabharata War Happen?" Page 172

⁵⁰⁴ Ibid. Page 114

- Moreover the word “**yojayet**” used by Krishna is third person, causative optative class parasmaipada verb – expressing his wish for worship to be done on Jyeshtha by Drona and others.
- Why did Krishna desire such worship if the worship was already done on Pushya day? This word with its stem ‘yuj’ refers to ‘join again.’ ‘Yojayati’⁵⁰⁵ means to restore, repair, put in order, adjust, arrange, undertake and such other similar words hinting at setting right the debacle that happened on the Pushya day. This is conveyed to Karna to have it done by Drona and others. This is not the same as ‘yajante’, the ātmanepada verb, nor ‘yojante’ to mean ‘plan or prepare’ suggested by Nilesch oak.⁵⁰⁶ It was to start again after offering ‘ahuti’ to Indra, on Jyeshtha day.
- From Karna’s account of the nimittas we get the first indication that Amawasya did not occur on Jyeshtha as Krishna had said. This falsifies all the researches that positioned the start of the Mahabharata war on Jyeshtha Amawasya!
- The expected Amawasya had instead occurred on the 13th tithi of the phase- i.e. in Vishakha. The visual observers were many at that time. Balarama was observing it from where he was while others like Vyasa and Karna had observed from Hastinapur.
- Right from the time they grasped the event of a comet fall, they must have been observing anxiously the sudden change in the shape of the moon.
- On the night of Uttara Phalguni they must have seen the moon compressed as it would appear on Ekadasi, in the place of Dasami in the normal course.
- On Chitra day, they must have seen the moon rising just two hours before sun rise whereas it should have risen four hours before sunrise. A perplexed Balarama rushed to Upaplavya to meet his brother and left soon after.
- The day of **Balarama’s arrival at Upaplavya** is not known, but the day of leaving is given in Mahabharata as Anuradha. And he has gone ahead with the tirtha yatra from Upaplavya.
- Nilesch Oak completely manipulates the Tirtha Yatra event⁵⁰⁷ by reversing the commencement and ending days mentioned by none other than Balarama himself.⁵⁰⁸
- In the normal course, Balarama’s arrival at Upaplavya and return on Anuradha star must have happened in the lunar month of Kartika. Now with the advancement of Amawasya in Vishakha, the return of Balarama in Anuradha is fit to be clubbed with the events of the next month, i.e. Margashirsha.

⁵⁰⁵ https://spokensanskrit.org/index.php?mode=3&direct=au&script=hk&anz=all&tran_input=yojayati

⁵⁰⁶ “When Did The Mahabharata War Happen?” p. 114-115

⁵⁰⁷ “When Did The Mahabharata War Happen?” pages 121- 125

⁵⁰⁸ Mahabharata: 9-33-5 <http://www.sacred-texts.com/hin/mbs/mbs09033.htm>

- The month ending on the 13th tithi sends another message that the reference to the shower of flesh and blood on the 14th tithi (Krishna Dwadasi)⁵⁰⁹ by Vyasa did not occur in Kartika month as there was no waning Chaturdasi in that month.
- However Karna did see a shower of flesh and blood, but that was within the first few days after the comet hit.⁵¹⁰
- The advancement of 'Jyeshtha' 'Amawasya' must have upset the war plans of Duryodhana for the second time within a fortnight.

6. Lunar Margashirsha month: (Sun in Scorpio / Sagittarius)

- Anuradha must have been the first day of the month. Balarama returned to Tirtha yatra on this day.
- The next day was Jyeshtha, and it is reasonable to assume that Duryodhana started his war plans on this day after worshiping Indra. Nilesch Oak clings on to the Pushya day dialogue of Duryodhana⁵¹¹ as the day of Kauravas leaving for Kurushetra. Duryodhana's plan was aborted due to bad nimittas (comet-hit). There is no other reference in Mahabharata suggestive of the starting date for the Kaurava army.
- The first fortnight of Margashirsha that followed the 13 tithi Amawasya in Kartika, did not complete a 15-day phase. The Full Moon of Margashirsha did not happen in the normal course (in the star Mrigashirsha), and not even on the 15th day from the last Amawasya.
- Counting from Anuradha (13th tithi Amawasya), the 15th day was Rohini, and the 14th day was Kritika. Vyasa's version indicates that Kshaya tithis were happening with the result that the Full Moon occurred on what normally could be Trayodashi. The star Kritika was running at the time of Full-moon in the month of Margashira!
- The two verses on dull Pournami on Kritika in Vyasa's narration hint at the 13th tithi Full Moon in Margashira. Nilesch Oak interpreted it as a lunar eclipse and even located it in his time line.⁵¹² The irony is that the Full Moon in Kritika that Nilesch Oak had interpreted as Kartika Purnima did not occur in the month of Kartika, it happened in Margashira!
- The original Full Moon in Kartika month occurred soon after Krishna left Upaplavya for Hastinapur. No untoward sightings were reported then, though nimittas portending a calamity were reported in Hastinapur.
- All the nimitta based astronomy and atmospheric sightings were reported after the Full Moon in the month of Kartika, i.e. in the waning phase and after the comet-hit on the Pushya day.

⁵⁰⁹Mahabharata: 6-3-31<http://www.sacred-texts.com/hin/mbs/mbs06003.htm>

⁵¹⁰Mahabharata: 5-141-21

⁵¹¹"When Did The Mahabharata War Happen?" page 117

⁵¹²"When Did The Mahabharata War Happen?" Page 100

- In the next round of the moon's journey, Vyasa (among others) was watching the waxing moon anxiously for its colour, size (to check normal waxing) and whether it could reach the expected star for Full Moon.
- It should have reached Rohini, the star of Moon (Indu) if everything was alright, but it did not.
- The Margashira month continued after the Full Moon and then came the day the Pandavas moved the troops.
- Krishna's call for starting on Pushya reported in Shalya parva in the words of Sanjaya could have happened only in Margashira Pushya!
- This call was made in Upaplavya after Krishna returned from Hastinapur, when Pushya of Kartika month was already over.
- Closely following this verse, the narration continues to state that Balarama left for the Tirtha Yatra in the Mairti star (Anuradha).

A brief on Balarama's pilgrimage

There is confusion on when Balarama left for the Tirtha yatra. This arises from the verse on Balarama leaving for the pilgrimage on Maitri star (Anuradha) after meeting Krishna at Upaplavya.⁵¹³ Later, on the day he came back to witness the Gada Yuddha at the end of the war, he told that he finished 42 days of pilgrimage having started it on a Pushya day, and ending it on a Shravana day.⁵¹⁴ The confusion is solved when we read the sequence of events narrated by Vaisampayana to the king Janamejaya in **Shalya Parva** who wanted to know the events pertaining to Balarama before he reached the war field to witness the Gada Yuddha.

The narration starts stating that the Pandavas took their position in Upaplavya. Krishna went on a peace mission to Hastinapur but returned unsuccessfully. He told the Pandavas ,⁵¹⁵

na kurvanti vaco mahyam kuravaḥ kālacoditāḥ
nirgacchadhvam paṇḍaveyāḥ puṣyeṇa sahitā mayā

(Ganguli's translation) "Urged by Fate, the Kauravas are for disregarding my words! Come, ye sons of Pandu, with me (to the field of battle), setting out under the constellation Pushya!"

⁵¹³ Mahabharata: 9-34-12

tīrthayātrām haladharāḥ sarasvatyām mahāyāsāḥ
maitre nakṣatrayoge sma sahitāḥ sarvayādavaiḥ

⁵¹⁴ Mahabharata: 9-33-5

catvāriṃśad ahāny adya dve ca me niḥsṛtasya vai
puṣyeṇa saṃprayāto 'smi śravaṇe punarāgataḥ

⁵¹⁵ Mahabharata: 9-34-9

na kurvanti vaco mahyam kuravaḥ kālacoditāḥ
nirgacchadhvam paṇḍaveyāḥ puṣyeṇa sahitā mayā

This talk happening in Kartika month after Pushya had gone by; Krishna must have meant the Pushya star of Margashirsha, the next month. (Figure 71)

Body	Longitude	Nakshatra	Pada	PF	CK	Ma	(Ju)	SL	HL
Lagna	10 Pi 02' 31.89"	UBha	3	As					
Sun - GK	6 Sg 32' 40.98"	Mool	2						
Moon - PK	7 Cn 10' 21.20"	Push	2						
Mars - MK	17 Sg 38' 39.60"	PSha	2	Ke					Mo
Mercury - BK	22 Sc 31' 30.51"	Jye	2						
Jupiter (R) - DK	2 Ta 42' 23.96"	Krit	2	Sa					Ra
Venus (R) - PiK	14 Sc 52' 25.41"	Anu	4						
Saturn - AmK	24 Cp 11' 17.63"	Dhan	1						
Rahu - AK	2 Le 33' 34.11"	Magh	1	Ma		(Ve)		Ur	Ne
Ketu	2 Aq 33' 34.11"	Dhan	3	Su					

Date:	September 29, -3136	Vedic Weekday:	Monday (Mo)
Time:	12:00:00 pm	Nakshatra:	Pushyami (Sa)
Time Zone:	5:30:00 (East of GMT)		(71.21% left)
Place:	78 E 01' 00", 29 N 10' 00"	Sunrise:	6:06:31 am
	Hastinapur, India	Sunset:	4:22:41 pm
		Janma Ghatika:	14.7282
Lunar Yr-Mo:	Krodhi - Margasira	Ayanamsa:	0-30-52.96
Tithi:	Krishna Tithiya (Ma) [Nitya Klinna]		
	(44.77% left)		

Figure 71: The day the Pandavas started off to Kurukshetra

- After this, while the troops were being mustered, Balarama addressed Krishna saying that they must render assistance to the Kauravas but Krishna ignored it. Enraged by this Balarama left for the pilgrimage in Anuradha star.
- The Bhoja chief (Kritavarman) joined (āśraya) Duryodhana while Yuyudhana sided with the Pandavas. These two must have accompanied Balarama until then. Now they had taken a position, with Balarama preferring to keep himself away.
- The next verse says, ““After the heroic son of Rohini had set out under the constellation Pushya, the slayer of Madhu, placing the Pandavas in his van, proceeded against the Kurus” (Ganguli’s translation)

“rauhiṇeye gate sūre puṣyeṇa madhusūdanaḥ
pāṇḍaveyān puraskṛtya yayāḥ abhimukhaḥ kurūn”⁵¹⁶

- Certainly Balarama could not have started in Margashirsha Pushya 18 days after he was supposed to have left for the pilgrimage on Anuradha. It must have been Kartika Pushya.
- In verse 9, Krishna commanded the Pandavas to start on Pushya day. In verse 13, it is again said they started after Balarama started in Pushya. Both did not start on the same Pushya day, but on the Pushya day of different months. This clears the mess on

⁵¹⁶ Mahabharata: 9-34-14

Balarama's Tirtha Yatra created by Nilesh Nilkanth Oak by changing days and modifying the meanings⁵¹⁷

- The subsequent verses talk about the elaborate arrangements and the festivities at the time of Balarama leaving for the pilgrimage. Definitely this description is not about the time after Balarama left on the day of Anuradha, for, the atmosphere was very tense then with the war clouds looming large, and Balarama himself in agitated mood.
- But this narration coming after the reference to Balarama starting on Pushya, it is obvious that Vaisampayana was narrating the gleeful events right from the time Balarama commenced his pilgrimage from Prabhas.
- The narration continues with all the places visited by him until the day he came to know about Duryodhana's fall and the Gada Yuddha slated to take place.

Mahabharata people had an **obsession with Pushya**. Never had they mentioned the upcoming Kali Yuga by that name, but only as Pushya Yuga. While describing the Yuga classification to the king Dhritarashtra just before the war began, Sanjaya said, “**kṛtaḥ tretā dvāparaṃ ca puṣyam ca kuruvardhana,**” by replacing Kali with Pushya, meaning nourishment and enhancement.⁵¹⁸ They wished to see Pushti and not Kali and always chose to make the best use of Pushya day.

Drupada's emissary was sent on a Pushya day. Balarama started on Pushya, so too the Pandavas. Balarama started his pilgrimage on Kartika Pushya⁵¹⁹ - on the day Krishna was at Hastinapur on peace mission. After he had started, the comet fell, causing many unfortunate side effects which were regarded as bad nimittas. Balarama noticed the changing phase of the moon and the advancement of Amawasya – the day meant for ancestral oblations. The changed phase of the waning moon must have troubled him and caused him to rush to Krishna, who was by then back to Upaplavya.

The visit to Upaplavya perhaps had twin purpose, of knowing the outcome of Krishna's peace mission and also to discuss the bizarre sightings. The fact that he has left on Anuradha day reveals that he had *done the Amawasya tarpan in the company of Krishna* the previous day,

⁵¹⁷“When Did The Mahabharata war Happen?” Pages 121 to 125

⁵¹⁸ Mahabharata: 6-11-3

⁵¹⁹ “Of all the 28 constellations (that include Abhijit), the pride of place appears to have been given to Pushya, the 8th star”, says Dr B.V.Raman, in his book “Muhurtha (Electoral Astrology), Page 24. Pushya neutralizes all defects and is preferred for any activity (except marriage) including travel.

i.e. Vishakha! After Amawasya, he had promptly resumed the pilgrimage the next day. By then he had already completed 10 days of pilgrimage.

- There is a marked difference in the talks of Balarama at Upaplavya.
- He conceded that a great slaughter was going to happen, perhaps after seeing the bad nimittas in the aftermath of the comet-hit.⁵²⁰
- Compared to this he sounded partial in his earlier talks. The first talk was after the marriage of Abhimanyu when he openly derided Yudhishtira.⁵²¹
- The next talk was when Duryodhana met him in Dwaraka after seeking Krishna's help. Balarama confided that he contradicted Krishna for the sake of Duryodhana. However he assured him that he would not side with anyone and advised him to fight in accordance with the rules of propriety.⁵²²
- He made up his mind not to fight at that time itself and conveyed his stance. That decision was not made at Upaplavya though he did tell Krishna that they must help the Kauravas.
- Therefore it is not correct to say that the decision to go on pilgrimage was decided by Balarama at Upaplavya after declaring his intention not to participate in the war, as Nilesch Oak says.⁵²³

The first day and the last day of Balarama's pilgrimage are simulated in Figures 72 and 73 respectively.

Body	Longitude	Nakshatra	Pada
Lagna	20 Ta 52' 24.18"	Rohi	4
Sun - GK	9 Sc 15' 02.89"	Anu	2
Moon - PK	13 Cn 43' 46.73"	Push	4
Mars - AmK	27 Sc 43' 25.57"	Jye	4
Mercury - MK	22 Li 05' 34.14"	Visa	1
Jupiter (R) - DK	5 Ta 59' 05.78"	Krit	3
Venus (R) - AK	28 Sc 43' 47.37"	Jye	4
Saturn - PiK	21 Cp 59' 55.74"	Srav	4
Rahu - BK	3 Le 58' 39.72"	Magh	2
Ketu	3 Aq 58' 39.72"	Dhan	4

Tithi:	Krishna Shashti
Vedic Weekday:	Tuesday (Ma)
Nakshatra:	Pushyami (Sa) (22.03% left)
Sunrise:	6:00:34 am
Sunset:	4:52:09 pm
Ayanamsa:	0-30-56.92

Date:	<u>September 2, -3136</u>
Time:	5:30:00 pm
Time Zone:	5:30:00 (East of GMT)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India
Lunar Yr-Mo:	Krodhi - Karthika

Body	Longitude	Nakshatra	Pada
Lagna	20 Ta 52' 24.18"	Rohi	4
Sun - GK	9 Sc 15' 02.89"	Anu	2
Moon - PK	13 Cn 43' 46.73"	Push	4
Mars - AmK	27 Sc 43' 25.57"	Jye	4
Mercury - MK	22 Li 05' 34.14"	Visa	1
Jupiter (R) - DK	5 Ta 59' 05.78"	Krit	3
Venus (R) - AK	28 Sc 43' 47.37"	Jye	4
Saturn - PiK	21 Cp 59' 55.74"	Srav	4
Rahu - BK	3 Le 58' 39.72"	Magh	2
Ketu	3 Aq 58' 39.72"	Dhan	4

Tithi:	Krishna Shashti
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Sunrise:	6:00:34 am
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Body	Longitude	Nakshatra	Pada
Lagna	20 Ta 52' 24.18"	Rohi	4
Sun - GK	9 Sc 15' 02.89"	Anu	2
Moon - PK	13 Cn 43' 46.73"	Push	4
Mars - AmK	27 Sc 43' 25.57"	Jye	4
Mercury - MK	22 Li 05' 34.14"	Visa	1
Jupiter (R) - DK	5 Ta 59' 05.78"	Krit	3
Venus (R) - AK	28 Sc 43' 47.37"	Jye	4
Saturn - PiK	21 Cp 59' 55.74"	Srav	4
Rahu - BK	3 Le 58' 39.72"	Magh	2
Ketu	3 Aq 58' 39.72"	Dhan	4

Tithi:	Krishna Shashti
Vedic Weekday:	Tuesday (Ma)
Nakshatra:	Pushyami (Sa) (22.03% left)
Sunrise:	6:00:34 am
Sunset:	4:52:09 pm
Ayanamsa:	0-30-56.92

Date:	<u>September 2, -3136</u>
Time:	5:30:00 pm
Time Zone:	5:30:00 (East of GMT)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India
Lunar Yr-Mo:	Krodhi - Karthika

Body	Longitude	Nakshatra	Pada
Lagna	20 Ta 52' 24.18"	Rohi	4
Sun - GK	9 Sc 15' 02.89"	Anu	2
Moon - PK	13 Cn 43' 46.73"	Push	4
Mars - AmK	27 Sc 43' 25.57"	Jye	4
Mercury - MK	22 Li 05' 34.14"	Visa	1
Jupiter (R) - DK	5 Ta 59' 05.78"	Krit	3
Venus (R) - AK	28 Sc 43' 47.37"	Jye	4
Saturn - PiK	21 Cp 59' 55.74"	Srav	4
Rahu - BK	3 Le 58' 39.72"	Magh	2
Ketu	3 Aq 58' 39.72"	Dhan	4

Tithi:	Krishna Shashti
Vedic Weekday:	Tuesday (Ma)
Nakshatra:	Pushyami (Sa) (22.03% left)
Sunrise:	6:00:34 am
Sunset:	4:52:09 pm
Ayanamsa:	0-30-56.92

Date:	<u>September 2, -3136</u>
Time:	5:30:00 pm
Time Zone:	5:30:00 (East of GMT)
Place:	78 E 01' 00", 29 N 10' 00" Hastinapur, India
Lunar Yr-Mo:	Krodhi - Karthika

Body	Longitude	Nakshatra	Pada
Lagna	20 Ta 52' 24.18"	Rohi	4
Sun - GK	9 Sc 15' 02.89"	Anu	2
Moon - PK	13 Cn 43' 46.73"	Push	4
Mars - AmK	27 Sc 43' 25.57"	Jye	4
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Jupiter (R) - DK	5 Ta 59' 05.78"	Krit	3
Venus (R) - AK	28 Sc 43' 47.37"	Jye	4
Saturn - PiK	21 Cp 59' 55.74"	Srav	4
Rahu - BK	3 Le 58' 39.72"	Magh	2
Ketu	3 Aq 58' 39.72"	Dhan	4

Tithi:	Krishna Shashti
Vedic Weekday:	Tuesday (Ma)
Nakshatra:	Pushyami (

Figure 72: The first day of Balarama's pilgrimage

⁵²⁰Mahabharata: 5-154-23 to 26 <http://www.sacred-texts.com/hin/mbs/mbs05154.htm>

⁵²¹ Mahabharata: 5-2 <http://www.sacred-texts.com/hin/mbs/mbs05002.htm>

⁵²²Mahabharata: 5-7- 23 to 27 <http://www.sacred-texts.com/hin/mbs/mbs05007.htm>

⁵²³“When Did The Mahabharata War Happen?” Page 121

Body	Longitude	Nakshatra	Pada				
Lagna	26 Ge 00' 01.26"	Puna	2			Ju	As
Sun - MK	19 Cp 34' 53.36"	Srav	3				
Moon - PiK	16 Cp 29' 40.26"	Srav	2				
Mars - BK	20 Cp 23' 21.10"	Srav	4				
Mercury - PK	3 Aq 23' 34.64"	Dhan	4				
Jupiter - DK	1 Ta 26' 57.38"	Krit	2				
Venus - GK	3 Sg 17' 09.93"	Mool	1				
Saturn - AmK	28 Cp 55' 53.57"	Dhan	2				
Rahu - AK	0 Le 19' 41.67"	Magh	1				
Ketu	0 Aq 19' 41.67"	Dhan	3				

Date:	November 10, -3136	Vedic Weekday:	Monday (Mo)
Time:	3:00:00 pm	Nakshatra:	Sravanam (Mo)
Time Zone:	5:30:00 (East of GMT)		(51.29% left)
Place:	77 E 12' 00", 28 N 36' 00"	Sunrise:	6:30:18 am
	New Delhi, India	Sunset:	4:46:00 pm
Lunar Yr-Mo:	Krodhi - Pushya	Janma Ghatika:	21.2375
Tithi:	Amavasya (Ra) [Chitra]	Ayanamsa:	0-30-46.73
	(25.72% left)		

Figure 73: The last day of Balarama's pilgrimage

Counting from Kartika Pushya, the 42nd day falls on Shravana in Pushya month – offering **a valuable input that the war ended in Pushya month!**

The next major revelation is that the month of Magha started on the 43rd day that is, on the day after the Gada Yuddha, because Amawasya was running on the 42nd day.

Two inferences are drawn from this:

(1) The **war started in Pushya month**

(2) The month of Magha that started on the next day was not the month of Uttarayana given that Bhishma didn't lay down his life in that month but had to prolong his wait. This is proof that this month of **Magha was an Adhika Masa**. It could not have been a Kshaya masa for the reason there was no Adhika masa prior to that and the closest adhika masa was in Caitra, far earlier in that year. In normal times the adhika masa cannot occur in Magha but Mahabharata war occurred at the most abnormal time ever faced by the mankind.

Balarama clearly stated the number of days and the stars running in the first and the last day of his pilgrimage. To quote Nilesch Oak's translation, "42 days have passed since I began the Tirtha yatra of Saraswati: I left on Pushya and am returning on Shravana."⁵²⁴

Unable to find these dates in his non-existent Epoch, Nilesch Oak creates a new version of Mahabharata by reversing the stars mentioned by Balarama and claims 'corroborative

⁵²⁴Ibid. Page 122

support’ for the end of the war date closer to the Full Moon, from the analogy that Balarama was surrounded by kings like the Full Moon surrounded by the nakshatras!⁵²⁵

6a. Lunar Margashira month Continued:

- The next event was the two sides assembling on the Magha day.⁵²⁶ We can say for sure that the war did not start on Magha day due to the main reason that Krishna Chaturdasi, the day when Vyasa noticed a shower of flesh and blood was yet to occur.
- There was no Krishna Chaturdasi in Kartika month. The **Krishna Chaturdasi of Margashira** was yet to happen when Moon was in Magha star. So the verse on Magha could not have meant the commencement of the war but only war-preparedness.
- The verse further says that seven planets were in the sky and the sun appeared with another sun on top it! The appearance of a second sun is understandable from the point of view of atmospheric refraction.

maghā viṣayagaḥ somas tad dinam pratyapadyata

dīpyamānās ca sampetur divi sapta mahāgrahāḥ (6-17-2)

dvidhā bhūta ivāditya udaye pratyadṛśyata

jvalantyā śikhayā bhūyo bhānumān udito divi (6-17-3)

Let me take up the second verse first. **Ganguli** translates that the Sun at rising seemed to be divided in twain and appeared to be ablaze.⁵²⁷ The verse further qualifies the appearance of the sun as having flame on its head (jvalantyā śikhayā). So the Sun appeared at the time of rise, with another flaming sun on its head. This has a *scientific explanation of apparent image of the sun appearing above the actual sun caused by atmospheric refraction*.

Under normal conditions, the rising or the setting sun is said to be an apparent image of the actual sun caused by atmospheric refraction. At sunrise even before the sun crosses the horizon, its rays are bent as they enter the earth’s atmosphere. The observer on the ground sees the image of the sun through the bent rays even though the sun is still under the horizon. (Figure 74) The same is repeated at sunset. Even after the sun had gone below the horizon, its rays reaching the atmosphere above the ground are refracted to the ground causing it to appear above the horizon.

⁵²⁵“When Did The Mahabharata War Happen?” Page 122

⁵²⁶Mahabharata: 6-17-2

maghā viṣayagaḥ somas tad dinam pratyapadyata

dīpyamānās ca sampetur divi sapta mahāgrahāḥ

⁵²⁷Mahabharata: 6-17 <http://www.sacred-texts.com/hin/m06/m06017.htm>

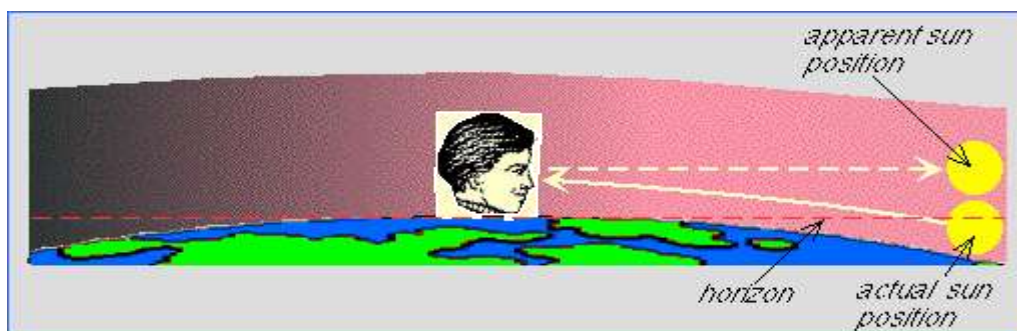


Figure 74: Sun appears before it rises above the horizon at sunrise

(Source: https://www.esrl.noaa.gov/gmd/grad/solcalc/apparent_sunrise.gif)

The Mahabharata verse hints at an extraordinary atmospheric condition when the light rays from the rising sun above the horizon, i.e. at the eye level was caused to deflect upwards and then downwards towards the ground. In the above figure, imagine the apparent sun as the actual sun above the horizon. Under standard conditions the sun light must have crossed the ground- level atmospheric layer of somewhat uniform density. If variations were there in the same layer, there is a likelihood of the rays getting deflected up and on encountering a differential density get refracted down. In such conditions, another sun appears above the actual sun at the horizon.

Similar appearance of the sun, on top of the sun was noticed at sunset in **Zimbabwe** on December 11, 2015. (Figure 75) ⁵²⁸



Figure 75: Two suns appearing one above the other.

Here the apparent sun is seen above the actual sun at the horizon. This ideally suits the description of Mahabharata verse that the sun appeared as two with the second one appearing ablaze. The only difference is that the above appearance happened at sunset while

⁵²⁸“Two Suns photographed in Zimbabwe during sunset” <https://www.sott.net/article/308393-Two-suns-photographed-in-Zimbabwe-during-sunset>

Mahabharata reports it at sunrise. The second image above the sun in both events can only be an apparent image, described as an image of flames of the sun on its head.

In the case of the above image, no scientific study is reported on this phenomenon except a generalised explanation that it is an optical illusion caused by an unusual atmospheric refraction. The place was reeling under drought and dryness when this appeared. This is in line with my explanation given in the previous chapter on changed refractive index when the atmospheric density is rarer at the surface due to heat. In Mahabharata times, a similar phenomenon due to an after-effect of the comet-hit had caused the sun appear as two, one above the other at sun rise.

Nilesh Oak interprets this verse as proof of solar eclipse on the 1st day of war!

According to Nilesh Oak, the “Solar eclipse seen from the Earth may be perceived as ‘the sun appearing as if split in two parts’”⁵²⁹ He interprets the ‘two’ as the two phenomenon of the eclipse – **Baily’s beads and solar corona!** The “description of ‘visible flames’ of the sun is referring to one or both of the phenomena,”⁵³⁰ and this was seen on the first day of the war!

In the very next paragraph Nilesh Oak quotes another verse that he translates as “*the sun appeared with its splendour lost*”⁵³¹ and considers it as corroborative of the occurrence of solar eclipse! So there are two different references to the sun and he is mixing them together for a single day. In one reference happening on Magha day, the sun appeared as a twin with flames. In the other reference found on the first of the war, the sun is described as having lost its splendour. Nilesh Oak just picks out the verses here and there to match them with his idea of an event unmindful of the context.

The sun losing lustre appears in a context⁵³² that talks about meteors falling with loud noise against the backdrop of the sunrise and dust rising and covering the world in darkness. This caused the sun appear without lustre. (niṣprabho 'bhyuditāt sūryaḥ) and there is absolutely no hint of an eclipse. But Nilesh Oak thinks this to be a reference to a solar eclipse on the first day of the war. He has mixed up the two verses, one happening on Magha day and another on the first day of war as a proof of solar eclipse on the first day of the war. If Nilesh Oak’s version is true, he must prove that there was Amawasya on Magha day. But he cannot prove that

⁵²⁹“When Did The Mahabharata War Happen?” Page 102

⁵³⁰Ibid. Page 102

⁵³¹Ibid. Page 102

⁵³²Mahabharata: 6-19- 33 to 39

many researchers identified as the date of commencement of the Mahabharata war – had appeared only a month later, on the last day of Margashira when the Sun was in Scorpio!

This is in perfect alignment with the movement of the sun that joins the moon in every 3rd star in its transit path. In the month of Kartika it joined the moon (in its 13 day phase) in Vishakha. Following the normal course, the next conjunction happened in Jyeshtha, but the month turned out to be Margashira! One month was lost due to the anomaly in the Moon's orbit following the comet-hit. Amawasya of Margashira occurred in the same location of the zodiac where Amawasya of Kartika month must have occurred.

The Pushya month started the next day. Until then the war had not started, is the revelation we get from this systematic sequencing of the events of Mahabharata based on the Panchanga factors given in the text.

7. Lunar Pushya Month (Sun in Sagittarius)

- There are no Panchanga based clues in the text of Mahabharata for the start of the Mahabharata war; however it is being traditionally held that Krishna rendered his 'Gita' (**Gitopadesa**) to Arjuna on Shukla Ekadasi in Margashira on the day before the start of the Mahabharata war. By this it is known that the war started on Shukla Dwadasi of Margashira.
- However Nilesh Oak considers "traditional belief worthless, as primary evidence, in support of any theory however I am willing to allow it as corroborative evidence for an established theory, i.e. established based on independent empirical evidence."⁵³⁵ This western approach coupled with the western concept of the astronomy simulator would not yield any evidence for the true date. Instead the approach should be to test the traditional belief (date of Gitopadesa) and find out whether it fits with the overall time scale derived from other astronomy observations. We will establish this in the following passages.

Deciphering the day of Gitopadesa

The derivation done so far revealed that there was no scope for the war in the lunar month of Margashira. The fact that (1) Balarama's 42 day pilgrimage ended in the star of Shravana in Pushya month and (2) Krishna Caturdasi that witnessed the shower of flesh and blood occurred on the last day of the lunar Margashira goes to prove that the war did not start anytime in the lunar Margashira month. This implies that the month of Gitopadesa was solar Margashira and not lunar Margashira. The present practice of celebrating Gitopadesa day in the lunar Margashira month is therefore not correct. The mis-timing can be attributed to the

⁵³⁵ "When Did The Mahabharata War Happen?" p.98

loss knowledge of computation of time in today's time keeping. Except Tamilnadu and a few other South Indian States, time keeping is not as it used to be in this country.

The sun which is the cause for Time is completely ignored in time computation. The Sun being the Pratyaksha Brahman is the source of all life. It is known as Ravi because it illuminates and protects all the three worlds.⁵³⁶ The sun is also known as Kāla or Time from whom every other computation of time flows.⁵³⁷ So the solar month cannot be left out in any reference to time.

Time must be calculated in four units, SAURA (SOLAR), SAUMYA (LUNAR), NAKSHATRA (STAR) AND SAVANA.⁵³⁸ Therefore a day must be punctuated in terms of the solar month, the lunar paksha-tithi, the star of the day and the enumeration from sunrise (savana). When we understand this, we know that the Gitopadesa took place in solar Margashira month in Shukla paksha Ekadasi. The simulation for the year Krodhi (Figure 77) shows that the sun was in the last degree of Margashira (Sagittarius) while the lunar phase was that of Pushya Shukla Ekadasi.

Sun - AK	29 Sg 54' 20.66"	USha	1
Moon - PiK	9 Ta 45' 08.81"	Krit	4
Mars - PK	5 Cp 11' 59.45"	USha	3
Mercury - GK	2 Cp 00' 54.74"	USha	2
Jupiter (R) - DK	1 Ta 16' 42.76"	Krit	2
Venus - MK	19 Sc 04' 17.61"	Jye	1
Saturn - BK	26 Cp 38' 05.03"	Dhan	1
Rahu - AmK	1 Le 21' 00.22"	Magh	1
Ketu	1 Aq 21' 00.22"	Dhan	3
Date:	<u>October 22, -3136</u>		
Time:	8:00:00 am		
Time Zone:	5:30:00 (East of GMT)		
Place:	77 E 12' 00", 28 N 36' 00"		
	New Delhi, India		
Lunar Yr-Mo:	<u>Krodhi - Pushya</u>		
Tithi:	<u>Sukla Ekadasi (Ma) [Neela Pataaka]</u>		
	(17.94% left)		
Vedic Weekday:	Wednesday (Me)		
Nakshatra:	Krittika (Su)		
	(1.86% left)		
Yoga:	Sukla (Mo) (77.56% left)		
Karana:	Vishti (Sa) (35.89% left)		
Ayanamsa:	0-30-49.58		

Figure 77: The date of Gitopadesa

⁵³⁶ Brahmanda Purana: 21-4

⁵³⁷ Brahmanda Purana: 23-145

⁵³⁸ Vayu Purana: 1-50-188; Aryabhatiya: 3-5

The sun had not left Sagittarius at sunrise of Shukla Ekadasi when the lunar month of Pushya was running. The traditionalists have recognised the time as Margashira (the month expressed by the position of the sun) while Shukla Ekadasi (lunar) was running at sunrise (savana). The star of the day was Kritika at sunrise. The location of the two luminaries (the sun and the moon) is remembered as the day of “**Vaikuntha Ekadasi**” in the Tamil speaking lands, of entering Vaikuntha along with Vishnu. Though the memory of Gitopadesa given on this day is lost, the power of Krishna (Vishnu) in granting Vaikuntha to the devotee is associated with this day.

In contrast, the day of Gitopadesa is remembered in other parts of India, but not on the exact day fulfilling the requisites of Time. The solar month is completely ignored and the date is remembered only in the lunar reckoning which at times pushes the date to the solar month of Kartika that corresponds to the day before Krishna started the peace mission! Misrepresentation like this must be corrected at the earliest.

The starting date of the Mahabharata war.

The day the war started can be deduced from the Gitopadesa date. That date must fulfil the astronomy features of the text. The simulated version of the day for Surya Siddhanta ayanamsa is given in Figure 78.

Body	Longitude	Nakshatra	Pada				
Lagna	25 Cp 18' 41.46"	Dhan	1			(Ju) GL	
Sun - DK	0 Cp 55' 40.26"	USha	2	A11 A7		AG	AB
Moon - BK	22 Ta 59' 49.57"	Rohi	4				
Mars - PiK	5 Cp 58' 47.27"	USha	3	Ke			
Mercury - PK	3 Cp 45' 39.68"	USha	3				
Jupiter (R) - GK	1 Ta 15' 19.47"	Krit	2				
Venus - MK	19 Sc 38' 09.99"	Jye	1				
Saturn - AmK	26 Cp 45' 00.22"	Dhan	2				
Rahu - AK	1 Le 17' 49.55"	Magh	1				
Ketu	1 Aq 17' 49.55"	Dhan	3				

Date:	October 23, -3136	Vedic Weekday:	Thursday (Ju)
Time:	8:00:00 am	Nakshatra:	Rohini (Mo) (2.52% left)
Time Zone:	5:30:00 (East of GMT)	Sunrise:	6:21:33 am
Place:	77 E 12' 00", 28 N 36' 00" New Delhi, India	Sunset:	4:29:26 pm
Lunar Yr-Mo:	Krodhi - Pushya	Janma Ghatis:	4.1018
Tithi:	Sukla Dwadasi (Me) [Vijaya] (16.09% left)	Ayanamsa:	0-30-49.44

Figure 78: The starting date of the Mahabharata War (SS ayanamsa)

The war started on the first day of the solar month of Pushya (Makara) in lunar Pushya Shukla Dwadasi. The day corresponds to **23rd October, 3136 BCE**. It was a Thursday with the moon at the last degree of Rohini at sunrise. It was followed by Mrigashirsha continuing

on the night of the 1st day of the war. *Counting from Mrigashirsha, Shravana started on the night of the 18th day of the war and ended on the 19th day when the Gada Yuddha was fought.* Balarama returned from his pilgrimage on that day.

Corroboration of the astronomy features for the first day of the war.

Vyasa's conversation with Dhritarashtra contains many nimittas in the nature of hints on the astronomy features of the day of the war or just before the war. There is no hint on the exact day (tithi or star) of the conversation between the two, but it must have taken place after Krishna Caturdasi of the lunar Margashira and before Pushya Shukla Dasami (the day before Gitopadesa). It is possible that it took place closer to the day of Gitopadesa, based on the narration by Sanjaya, enabled with Divine Vision.

Addressing the basic question why Vyasa narrated too many nimittas portending destruction, it is only but natural to expect the king to seek astrological opinion in the event of a war. Only this conversation is heavily loaded with nimittas that include astronomy observations. The other contexts giving such observations, such as Karna- Krishna conversation and Drona's narration on the 10th day of the war are also the result of some fear about a calamity. This is in tune with Prasna astrology (horary) for war (Yuddha Prasna) and to decipher the sudden, unusual abnormal events (nimittas).

Vyasa revealed every adverse feature, classified as nimittas of three types (terrestrial, atmospheric and celestial) in addition to the then prevailing planetary combinations. The entire narration can be understood from the perspectives given in Brihad Samhita.

*The nimittas that appeared after the comet-hit are narrated first.*⁵³⁹ The narration starts from the appearance of the Sun at twilights, the abnormal colour of **Parigha** (halo) around it, the shapes of the clouds (**Kabandha**- headless trunk appearance) covering the sun and the **abnormal animal behaviour**. In that context he expresses “**aho ratram maya dhrishtam**” verse (explained earlier) on how the tithis were getting reduced (kshaya) with the moon appearing without any features and of the colour of fire culminating in the Full Moon in Kritika (in Margashira, implied). Only in that context he expressed Arundhati keeping her husband at her Prishtha, Saturn afflicting Rohini (referring to the Moon, the planetary lord of Rohini) and the change in the marks on the moon. With this the 2nd chapter in Bhishma Parva ends covering celestial and atmospheric nimittas.

⁵³⁹ Mahabharata: 6-2

The narration continues in the 3rd chapter starting with the terrestrial nimittas and ending with the fall of the comet on a Pushya day, implying that all these were associated with the COMET-HIT.

dhūmaketur mahāghoraḥ puṣyam ākramya tiṣṭhati (6-3-12b)

After this he started narrating the planetary combinations that do not bode well for the king and the people. In between he does talk about the odd events during and following the comet-hit. Let me pick out only the planetary observations to cross check with the date of the first day of the war derived from the astrology simulator (Figure 78).

To judge any event, the locations of three auspicious planets namely Venus, Jupiter and Mercury are scrutinized. For a war, Mar's location is important to note. To fathom the intensity of havoc caused to the public at large, the position of Saturn is noticed. Vyasa dealt with all these. They are explained here in the sequence given by Vyasa.

1. "Mars wheeleth towards **Magha and Vrihaspati** (Jupiter) towards *Sravana*" is the translation by Ganguli for the following verse of Vyasa.

maghāsv aṅgārako vakraḥ śravaṇe ca bṛhaspatiḥ (6-3-13b)

On the day of the war Mars was at the 6th degree in Capricorn and Jupiter in the 2nd degree of Taurus. Jupiter was retrograde, while Mars was not. Therefore "Angarako Vakra" is understood with the other meaning, the 'bent' aspect of Mars – on the 8th sign from where it is positioned. From the 6th degree in Capricorn, its 8th aspect falls on Magha in Leo. In the case of Jupiter its 9th aspect starts from the 2nd degree of Capricorn to the 2nd degree of Aquarius within which Shravana is located. Since Jupiter was retrograde, its 9th aspect reversed on the region where Shravana is located. The specific reference to Shravana is because it is lorded by the Moon, which also happens to be the lord of the Prajapati star, Rohini.

2. "The Sun's offspring (*Sani*) approaching towards the constellation **Bhaga**, afflicteth it," says Ganguli.

bhāgyaṃ nakṣatram ākramya sūryaputreṇa pīḍyate (6-3-14a)

This also matches with the time of commencement of the war. Saturn was at the 27th degree of Capricorn. From there its 7th aspect starts from the 27th degree of Cancer and ends at the 27th degree of Leo where Purva Phalguni has just begun. The attack (Akrama) or affliction to Bhaga, the deity of Purva Phalguni had started just before the war started. Bhaga is the name

of the sun when it scorches everyone alike without giving respite. So the collusion between the father and the son (the sun and Saturn) was expected to give terrible results.

Nilesh Oak did a faux pas of this verse which will be detailed in Appendix I on the manipulations done by him.

3. Following Mars and Saturn, Vyasa started narrating the position of Venus. Venus, also known as **Shyama graha**⁵⁴⁰ is noted by Vyasa in two locations in two verses.

śukraḥ proṣṭhapade pūrve samāruhya viśāṃ pate
 uttare tu parikramya sahitaḥ pratyudīkṣate
 śyāmo grahaḥ prajvalitaḥ sa dhūmaḥ saha pāvakaḥ
 aindram tejasvi nakṣatram jyēṣṭhām ākramya tiṣṭhati
 (6-3-14b and 15)

Taking up the 2nd verse, it says that Venus was in the company of Mars in Jyeshtha. This was so at the time of the comet-hit – and both were seen with red-crest after sunset at that time. The term “*Dhuma saha Pavaka*” means “*with the shining Dhuma*”. Dhuma is a reference to Mars, known by its Upagraha by that name. This combination (Venus and Mars) is not auspicious.

Before stating this inauspicious position of Venus, Vyasa recalled an earlier time (purve) when Venus was retrograde in the Proshthapada stars. The first line states, ‘earlier the planet Venus ascended from **Purva Bhadrapada** star’. In the second line it is said, ‘(ascended to) Uttara Bhadrapada star. But it did a turn-around to join that (Purva Bhadrapada) again’ which means Venus had gone back to Purva Bhadrapada by retrogression.

Overall the two verses talk about Venus, which in an earlier time made a turnaround from Uttara Bhadrapada to Purva Bhadrapada, after ascending from the latter, had joined the burning **Dhuma Graha** (Mars) and afflicted (by occupation) Jyeshtha ruled by Indra. Two different locations, each portending something bad was narrated by him, of which the second location was as on the comet-hit date and continued on the first day of the war.

The three stars mentioned here are noted for certain auspicious or cruel nature. Uttara Bhadrapada is auspicious for coronation, kings and permanency. Purva Bhadrapada is suited for deceit, setting fire and imprisonment.⁵⁴¹ **Jyeshtha** is known as a ‘**krura**’ (cruel) star.⁵⁴² Venus, an auspicious planet for prosperity, if it turns around Uttara Bhadrapada to reach

⁵⁴⁰ Refer Ch 4. Varahamihira, Brihat Jataka: II -4

⁵⁴¹ B.V. Raman, “Muhurtha”, p.23, 24

⁵⁴² Yajur Vedanga Jyothisha: V 36

Purva Bhadrapada, it foretells imprisonment and troubles for the king. Having done such a turn-around earlier, Venus reached the cruel Jyeshtha to join the burning planet, Mars when terrible events were witnessed on the Pushya day - the day Duryodhana ordered his troops to move. This movement of Venus didn't bode well for the ruling king.

So, these two verses on Venus were mere re-callings of its inauspicious transits in the past, the last of which occurred on the day Duryodhana planned to move his army. Perhaps Vyasa wanted to remind the king of the ominous transits in the past, as the planet continued to remain in Jyeshtha, lorded by Indra at the time of war.

(After this, Vyasa stated the reverse movement of Dhruva star and the Parusha Graha's (Saturn's) affliction – which were discussed in the previous chapter in the context of the comet hit)

4. The next verse is a reference to the **position of Mars** at the time of the commencement of the war.

vagrānuvakramṇ kṛtvā ca śravaṇe pāvakaṇḍhaḥ
brahmarāṣiṃ samāvṛtya lohitaṅgo vyavasthitaḥ (6-3-17)

'Pāvakaṇḍhaḥ' and 'lohita' refer to Mars. It went '**vagrānuvakramṇ**'- meaning going vakra again and again – which is impossible, and therefore it must refer to retrogression (once) and its cruel aspect (the second time). The verse also gives its location at Brahmarasi, a reference to the star Abhijit. In the earlier times, when Abhijit was part of the zodiac, it spread from the last 3 degrees of Sagittarius to the first 10 degree of Capricorn.⁵⁴³ At the time of the start of the war, Mars was at the 6th degree of Capricorn where Abhijit was present earlier.

Now coming to 'vagrānuvakramṇ', the last time that Mars was in retrogression, it cast its 7th aspect on Shravana in Capricorn from its location in Cancer (Figure 47). It was at the start of *Uttarayana in the same year Krodhi*. Now towards the end of the year (the year ended with the start of the next Uttarayana), Mars had reached Capricorn and was afflicting Shravana that was next to the star it was transiting. A planet afflicts the previous and the next star from the star of its location. This aspect is recognised as vakra which means cruel.

5. After narrating a series of non-astronomical nimittas following the above verse that included the two planets rising with red crest (established in the last chapter as Venus and Mars at the time of the comet-hit) and **the dim appearance of the Sapta rishi stars**, Vyasa continued to tell a planetary combination as follows.

⁵⁴³ Explanation in the 13th chapter

saṃvatsarasthāyinau ca grahau prajvalitāv ubhau
viśākhayoḥ samīpasthau bṛhaspatiśanaiścaraḥ (6-3-25)

The two blazing planets, viz., *Vrihaspati* and *Sani*, having approached the constellation called *Visakha*, have become stationary there for a whole year – this is the translation by Ganguli for the verse given below.

The translation seems faulty considering the word “SAMVATSARASTHĀYINAU” referring to Samvatsara, the first year of the Yuga, left out in the translation. Krodhi was the first year then, known as ‘Samvatsara’. Vyasa was referring to the two planets (Jupiter and Saturn) staying in their own houses at the time of the beginning of the Samvatsara (Uttarayana day in Krodhi – Figure 3). They were stationed in their own respective houses, *Jupiter in its own house of Pisces and Saturn in its own house of Capricorn*. Vyasa could recall this, since it is a practice to make year-long prediction from the planetary combinations of first day of the year.

At that time, both Jupiter and Saturn were well fortified by occupying their own houses. But alas, two grahas cast their malefic aspect on Vishakha, identified with Lord Kartikeya, the celestial Commander-in-chief. Any affliction to it was keenly watched as an omen indicating success or defeat in a war. One can find this in the list of omens by Rama to Lakshmana before the start of the war with Ravana.⁵⁴⁴

The two grahas were Saturn casting its 10th aspect on Vishakha and Mars casting its 4th aspect on Vishakha from Cancer. This foretells destruction due to war. This is purely an astrological concept much like most other astronomy observations. Nilesch Oak can be seen giving an absurd ‘corroboration’ for this verse, which will be detailed in the Appendix I.

6. The next verse talks about the appearance of the sun and the star transited by the sun soon after the comet-hit. A brief note of this was given in the 4th chapter in the context of what Tivro star means.

kṛttikāsu grahasṭivro nakṣatreprathame jvalan
vapūṃṣy apaharan bhāsā dhūmaketur iva sthitaḥ (6-3-26)

A word for word meaning of this verse is given, since this is also one of the mis-interpreted verses.

Meaning:

⁵⁴⁴Valmiki Ramayana: 6-4-51 Vishakha was the star of the Ikshvakus

kṛttikāsu graha = the graha of Krittika (ablative, genitive).

tīvro = fierce (SB 10.27.12), sharp (SB 10.47.19) (masculine, vocative, singular, stem: tīvra)

nakṣatre = in the star (locative, singular)

pratahme = at first

jvalan = blazing (masculine, nominative, singular, stem: jvalat)

vapūṁśy = √vap = to shear, cut, shave, mow. (second person, singular, present imperative class 1 parasmaipada)

apaharan = taking away by cheating (SB 5.14.26)

bhāsā = to appear ("as" or "like" Nominal verb or instrumental case of an abstract noun) stem: bhās.

dhūmaketur = comet

iva = like

sthitaḥ = standing, staying, there remaining (SB 11.1.10) (masculine, nominative, singular, past passive participle, stem: sthita)

Interpretation of kṛttikāsu graha: The sun is the “Kṛttikāsu graha”. Each planet is assigned 3 stars which become its dispositors. Krittika is the dispositor of the Sun and therefore the Sun is called as Krittika’s graha.

Tivro nakṣatra : Among the star categories, Moola, Jyeshtha, Arudra and Aslesha are regarded as ‘sharp’ stars.⁵⁴⁵ Among these the Sun entered Jyeshtha a week after the comet-hit. Therefore Jyeshtha is indicated here as “tīvro nakṣatra”.

Overall meaning:

Krittika’s graha, the sun at first blazing in Jyeshtha, the tivro star, got sheared off and stayed appearing like a Dhumaketu, a comet.

The appearance of the sun in the days following the comet-hit is described in this verse. In the event of a comet-hit, the particulate matter thrown into the atmosphere blocks the sunlight and makes it appear smoky and dull. On the 7th day after the comet-hit, the sun entered Jyeshtha, the tivro star. By then the atmospheric aberrations obstructed the sun’s rays reaching the earth. It made the sun appear hazy and dusty like a comet with a tail.

⁵⁴⁵ Dr.B.V.Raman, “Muhurtha”, p. 23

7. The next verse refers to Mercury travelling through all the stars that it traversed earlier, causing great fear.

triṣu pūrveṣu sarveṣu nakṣatreṣu viśāṃ pate

budhaḥ sampātate 'bhīkṣṇaṃ janayan sumahad bhayam (6-3-27)

Nilesh Oak has written in his book, “Mercury travelling through all the *nakshatras* over a period of one year is a trivially true observation and no verification is required.”⁵⁴⁶ Isn't this true for all the planets? All the planets do travel through all the stars in the sky (zodiac), so what is the big deal about singling out Mercury alone here that this travel of Mercury caused great fear? By simply saying that this is trivially true, requiring no verification, Nilesh Nilkanth Oak has once again demonstrated his inability to read the verse properly and derive the idea behind it.

The verse states that Mercury hurriedly (trishu) went through the stars it travelled earlier, by which retrogression is meant. ‘Abhīkṣṇa’ means ‘repeated’ and ‘sampāta’ means collision. Retrogression of Mercury started on 8th August 3136 BCE in the star Anuradha in Scorpio when the sun was in Libra (Aswayuja month). It crossed the sun on 20th August and ended retrogression quickly on 28th August, four days before the comet-fall. Within 20 days Mercury quickly moved backward from Scorpio to Libra, from Anuradha to Vishakha through which it travelled earlier. This was seen as a bad omen by Vyasa.

Body	Longitude	Nakshatra	Pada	Body	Longitude	Nakshatra	Pada
Lagna	19 Pi 18' 24.13"	Reva	1	Lagna	23 Ar 55' 30.21"	Bhar	4
Sun - MK	13 Li 57' 41.12"	Swat	3	Sun - DK	4 Sc 08' 10.61"	Anu	1
Moon - PiK	10 Le 56' 30.74"	Magh	4	Moon - PK	9 Ta 56' 37.25"	Krit	4
Mars - PK	9 Sc 44' 51.49"	Anu	2	Mars - BK	24 Sc 03' 14.34"	Jye	3
Mercury (R) - DK	3 Sc 37' 39.45"	Anu	1	Mercury (R) - MK	22 Li 01' 04.02"	Visa	1
Jupiter (R) - GK	9 Ta 18' 42.05"	Krit	4	Jupiter (R) - GK	6 Ta 40' 33.37"	Krit	4
Venus - AK	24 Sc 53' 40.12"	Jye	3	Venus (R) - AK	29 Sc 52' 54.94"	Jye	4
Saturn - BK	20 Cp 54' 28.60"	Srav	4	Saturn - PiK	21 Cp 41' 46.79"	Srav	4
Rahu - AmK	5 Le 18' 16.68"	Magh	2	Rahu - AmK	4 Le 14' 41.39"	Magh	2
Ketu	5 Aq 18' 16.68"	Dhan	4	Ketu	4 Aq 14' 41.39"	Dhan	4

Date:	August 8, -3136	Date:	August 28, -3136
Time:	4:30:00 pm	Time:	4:30:00 pm
Time Zone:	5:30:00 (East of GMT)	Time Zone:	5:30:00 (East of GMT)
Place:	78 E 01' 00", 29 N 10' 00"	Place:	78 E 01' 00", 29 N 10' 00"
	Hastinapur, India		Hastinapur, India
Lunar Yr-Mo:	Krodhi - Aswayuja	Lunar Yr-Mo:	Krodhi - Karthika
Tithi:	Krishna Dasami (Mo) [Nitya]	Tithi:	Krishna Pratipat (Su) [Kaameswari]
	(25.16% left)		(51.61% left)
Vedic Weekday:	Friday (Ve)	Vedic Weekday:	Thursday (Ju)
Nakshatra:	Magha (Ke)	Nakshatra:	Krittika (Su)
	(17.94% left)		(0.42% left)

Figure 79: The hurried retrogression of Mercury

⁵⁴⁶“When Did The Mahabharata War Happen?” Page 79

The above two verses appearing one after the other in the narration are about the comet-hit time. Following these two, the rest of the version is only about that period when Amawasya appeared in Trayodasi. The overall assessment shows that the comet-hit and the subsequent dis-quiet at all levels and all around had caused all round fear.

Four out of seven planetary positions given by Vyasa in his conversation, match well with the planetary combinations seen on the first day of the war (Figure 78). *The other three match well with the time of the comet-hit.* There is another planetary position given on the 17th day of the war. That is also cross checked with the date deduced in figure 78.

8. At the time of **fall of Karna**, “The planet Jupiter, afflicting the constellation Rohini assumed the hue of the moon or the sun.”⁵⁴⁷

bṛhaspatī rohiṇīm samprapīḍya; babhūva candrārkaśamānavarṇaḥ (8-68-49)

Karna fell on the 17th day (9th November, 3136 BCE) by which time Jupiter resumed its forward motion in Kritika at Taurus 1° 26'. Rohini starts at Taurus 10°. Jupiter's orb extends till 9° by which it was able to do “samprapīḍya” of Rohini – ‘set out to afflict’.

Further corroboration of the date is obtained from twin eclipses during the war mentioned in the text

Twin eclipses during the war

Thirteen day twin eclipses in the month of Kartika find no mention in Mahābhārata, which however talks about twin eclipses when the war was on. There was a lunar eclipse on the 3rd day of the war and a solar eclipse on the 19th day at the time of **GADA YUDDHA** between Bhima and Duryodhana.

The lunar eclipse on the third day of the war.

On the 10th day of the war, Drona expressed that the moon rose up with head downwards due to the wheeling of the apasavyam graha!⁵⁴⁸

apasavyam grahāś cakrur alakṣmāṇam niśākaram
avākśirāś ca bhagavān udatiṣṭhata candramāḥ

This being a crucial verse establishing the occurrence of a lunar eclipse while the war was on, the exact translation is given here.

Meaning:

⁵⁴⁷ Mahabharata: 8-8-94 <http://www.sacred-texts.com/hin/m08/m08094.htm>

⁵⁴⁸ Mahabharata: 6-108-12

apasavyam grahās = contrary, opposite (Mb.5.138.27) (stem: apasavya) a reference to Rahu that moves in opposite direction.

cakrur = made, performed (third person plural tense paradigm perfect class parasmaipada √kr)

alakṣmāṇam = bad, inauspicious sign (stem: alakṣaṇa)

niśākaram = the moon (SB 2.7.33) (stem: niśākara) (accusative)

avākśirās = avAk- śirās. head turned downwards (adjective) having its upper end turned downwards (Monier-Williams, Sir M. (1988). headlong (Monier-Williams, Sir M. (1988)

ca = and (connecting word)

bhagavān = the god

udatiṣṭhata = arose (SB 3.26.70)

candramāḥ = the moon

Overall meaning:

“The Moon god rising with its head downwards (was) made inauspicious by the apasavyam graha (Rahu).”

- This verse is in clear contrast to the “*candrasūryāv ubhau grastāv*” verse having no reference to Rahu or Ketu. By having stated ‘**apasavyam graha**’, Drona had clearly indicated the eclipse by Rahu, the planet that goes in opposite direction.
- The word ‘avākśirās’ refers to the moon’s ‘**heads downward**’ position which is just the opposite of the normal appearance of ‘heads up’ when the crescent moon rises. The pointed ends of the crescent moon are generally recognised as the ‘horns of the moon’. When they are described downwards, it refers to lunar eclipse. (This applies to solar eclipse also). One can find this expression used in the context of eclipses in **Siddhanta Shiromani** by Bhaskara II.⁵⁴⁹ By looking at the angles of the ‘horns’ of the moon or the sun, one can judge the duration of the eclipse, says Bhaskara II.
- One can interpret this verse as waning moon rising in the sky on the night before **Drona** made this observation. But the waning moon doesn’t appear with horns down.

⁵⁴⁹Siddhanta Shiromani: Ch 8- verses 7 & 8, Translation by Pundit Babu Deva Sastri.

Nilesh Oak treats this verse as evidence for waxing phase at the time of war, and presents this “in support of ‘Amawasya’ as the first day of War”⁵⁵⁰ in his regular habit of picking out anything from anywhere to ‘corroborate’ his ‘findings.’

- Here Nilesh Nilkanth Oak equates the reference to lunar eclipse with Amawasya!! In the same context he admits that he was “*indifferent and insensitive to changing phases and positions of the moon*” before he began writing his book. It is very well understood that he was indifferent to watching lunar eclipses too!
- A reading of Brihat Samhita reveals what this verse says. In the chapter on Rahu, ten types of eclipses are outlined on the basis of the movement of the obscuring of the disc. The second type is “**Apasavyam**” – that commences at the right side of the disc and moves over to the left.⁵⁵¹ This is ominous of suffering from rulers and robbers according to that text. The same idea of inauspiciousness caused by the apasavyam graha is expressed in the verse as “apasavyam grahās cakrur alakṣmāṇam.”
- Drona has given a picture perfect description of the movement of the shadow from right to left that made the rising moon inauspicious with its heads downwards. (Figure 80)



Figure 80: Moonrise with pointed heads down (Lunar eclipse - Apasavyam)

- Similar appearance was noticed in the solar eclipse of 26th December, 2019 when the moon slid across the solar disc making the sun appear with horns down. (Figure 81)



Figure 81: Solar eclipse with heads down (Photo credit: @bharanivt)

⁵⁵⁰“When Did The Mahabharata War Happen?” page 104

⁵⁵¹Brihat Samhita: 5-44

- The month was Pushya but the sun had just entered Capricorn at that time. It may be recalled that **Rahu was at the beginning of Leo** when the comet fell down.
- It caused the moon to move faster and in a slightly altered orbit with the ascending node pushed a little. It is not known how far it moved, but there is an interesting discrepancy noticed between the simulated version and the verse of Mahabharata.
- The simulation (Figure 82) shows the lunar eclipse to have occurred at pre-dawn of the next day in the star Punarvasu. The sun- moon opposition is there, but the moon is beyond the required distance of 13 degrees from Rahu to have an eclipse.⁵⁵²

Body	Longitude	Nakshatra	Pada
Lagna	2 Cp 01' 47.76"	USha	2
Sun - PK	3 Cp 55' 06.62"	USha	3
Moon - DK	0 Cn 19' 21.17"	Puna	4
Mars - PiK	8 Cp 16' 03.90"	USha	4
Mercury - MK	8 Cp 49' 50.87"	USha	4
Jupiter (R) - GK	1 Ta 12' 28.04"	Krit	2
Venus - BK	21 Sc 25' 11.20"	Jye	2
Saturn - AmK	27 Cp 05' 26.02"	Dhan	2
Rahu - AK	1 Le 08' 31.42"	Magh	1
Ketu	1 Aq 08' 31.42"	Dhan	3

Date:	October 26, -3136	Vedic Weekday:	Saturday (Sa)
Time:	6:15:00 am	Nakshatra:	Punarvasu (Ju)
Time Zone:	5:30:00 (East of GMT)		(22.58% left)
Place:	77 E 12' 00", 28 N 36' 00"	Sunrise:	6:22:37 am (October 25)
	New Delhi, India	Sunset:	4:30:41 pm (October 25)
		Janma Ghatika:	59.6830
Lunar Yr-Mo:	Krodhi - Pushya	Ayanamsa:	0-30-49.00
Tithi:	Pournimasya (Sa) [Chitra]		
	(29.97% left)		

Figure 82: The Lunar eclipse on the night of 3rd day of the war

This simulation doesn't concur with the Mahabharata version that an eclipsed moon was rising in the evening (udatishata). The eclipse occurred 12 hours before the simulated version. Figure 83 represents the simulated version for 6-30 pm on the 3rd day of war.

Body	Longitude	Nakshatra	Pada
Lagna	29 Cn 17' 43.48"	Asre	4
Sun - GK	3 Cp 25' 06.29"	USha	3
Moon - BK	24 Ge 13' 04.80"	Puna	2
Mars - PK	7 Cp 53' 04.41"	USha	4
Mercury - PiK	7 Cp 59' 15.67"	USha	4
Jupiter (R) - DK	1 Ta 12' 49.18"	Krit	2
Venus - MK	21 Sc 06' 30.37"	Jye	2
Saturn - AmK	27 Cp 01' 59.95"	Dhan	2
Rahu - AK	1 Le 10' 04.77"	Magh	1
Ketu	1 Aq 10' 04.77"	Dhan	3

Date:	October 25, -3136	Vedic Weekday:	Saturday (Sa)
Time:	6:30:00 pm	Nakshatra:	Punarvasu (Ju)
Time Zone:	5:30:00 (East of GMT)		(68.37% left)
Place:	77 E 12' 00", 28 N 36' 00"	Sunrise:	6:22:37 am
	New Delhi, India	Sunset:	4:30:41 pm
		Janma Ghatika:	30.3080
Lunar Yr-Mo:	Krodhi - Pushya	Ayanamsa:	0-30-49.08
Tithi:	Pournimasya (Sa) [Chitra]		
	(76.67% left)		

Figure 83: Lunar eclipse at moon rise on the 3rd day of the war

⁵⁵² The moon must be within 13 degrees from the nearest node for a lunar eclipse. The sun must be within 19 degrees from the nearest node for a solar eclipse.

This also shows more than the required span of 13 degrees to make a lunar eclipse possible. But the fact that the eclipse did happen goes to prove that **Rahu shifted towards Pushya at the time of collision.**

In figure 44 of the 12th chapter we found that Rahu moved towards the sun (in the words of Karna and Vyasa) because the moon shifted to a newer orbit. Now the lunar eclipse of the rising full-moon at evening could be possible only if Rahu had shifted to within 13 degrees of the moon that extends till the 4th degree of Pushya! This shows that THE COLLISION CAUSED TO THE MOON TO SWING DOWNWARD IN ITS PATH CUTTING THE ECLIPTIC IN SUCH A WAY THAT THE POINT OF INTERSECTION OF THE LUNAR ORBIT AND THE ECLIPTIC (SUN'S PATH) SHIFTED FROM WHERE IT WAS UNTIL THEN. In that orbit that is shorter than normal, Rahu could be seen to have shifted towards the sun, though in reality it was pushed further in its path towards Pushya. This shift caused the lunar eclipse 12 hours earlier than normal (from the location found in the simulator).

It is also likely this *eclipse was not predicted beforehand*. There is a practice – continuing till date – to make yearlong predictions including the expected eclipses, well ahead, at the time of year beginning. In Mahabharata times, such predictions were made at Uttarayana, when the year began. This is corroborated by the “*saṃvatsarasthāyinau*”⁵⁵³ verse explained earlier.

Drona was apparently taken aback by the nimittas witnessed on the 10th day of the war that happened to be the 7th day after the lunar eclipse, portending danger to the life of Bhishma. The other nimittas expressed by Drona in the same context tally excellently with the views given in Brihat Samhita.

- Brihat Samhita says that “If within seven days from the termination of an eclipse, there should appear a halo around the sun or moon, there will be disease in the land.”⁵⁵⁴
- If within seven days of an eclipse “there should occur any meteor-fall, the ministers will die, if clouds of various hues should appear, mankind will suffer from various fears.”⁵⁵⁵
- Drona reported meteors falling from solar disc. He also reported Parigha⁵⁵⁶ (halo) around the sun and Parivesha⁵⁵⁷ (halo) around the moon.
- These were witnessed within seven days of the eclipse of the moon, which portends something bad.

⁵⁵³ Mahabharata: 6-3-25

⁵⁵⁴ Brihat Samhita: 5-94

⁵⁵⁵ Brihat Samhita: 5-93

⁵⁵⁶ Mahabharata: 6-108-9

⁵⁵⁷ Mahabharata: 6-108-10

- The meteor fall on this day could be a continuing collision of the tail part of the comet showering down as meteors.
- The 10th day of the war coming within seven days after the Full Moon (that was eclipsed), it is a clear indication that the war was started in late waxing phase (Shukla Paksha) with most of the war days seeing the waning phase (Krishna Paksha).
- Only in this sequence of days, there could be late moon-rise on the 14th day of the war – an information very clearly given in Mahabharata – but Nilesch Oak with his scientific acumen and logical reasoning dared to ignore it, question it and manipulate it to match with the dates of the time-line he derived through a ‘revolutionary’ research using Voyager Simulator Nyaya!
- The full moon and the lunar eclipse happening on the 3rd day of the war comes with a surprising parallel in Arjuna and Bheema forming ‘ardha-candra’ vyuha to counter ‘Garuda’ vyuha formed by Bhishma.
- The choice of Ardha Candra in whose horns Arjuna and Bheema positioned themselves seems to convey the impending eclipse on that day of full moon.
- However the **vyuha was not successful for the Pandavas** as Arjuna and Krishna were severely attacked by Bhishma, *forcing Krishna to pick up his weapon (discuss or cakarayudha) to slay Bhishma, only to be pacified by Arjuna.*
- This sequence establishes that Bhishma fell on the seventh day of the waning phase of the Pushya month that happened to be the 10th day of the war.
- At the time of deciding to cast down his life Bhishma must have been thinking that he could leave the world soon, as Magha was nearing. But alas, the Magha that followed was Adhika Magha!
- It made him wait throughout the adhika masa and leave the world in Shuddha Magha when the sun turned northward on Shukla Ashtami of Shuddha Magha!
- So Bhishma did not wait for 98 days as Nilesch Oak wants us to believe.

The solar eclipse on the 19th day of the war.

There is a general perception that the war ended on the 18th day. The remaining warriors, Uluka and Shakuni were slain by the noon of the 18th day after which Duryodhana fled on foot to hide himself in **Dvaipayana Lake**.⁵⁵⁸ The Pandavas started searching for the whereabouts of Duryodhana, but retired to their camp without success. That the sun had set by then is revealed in four different verses when (1) the three survivors of the Kaurava army, namely, Kritavarma, Kripa and Aswattama stealthily went on to meet Duryodhana lying in

⁵⁵⁸ Mahabharata: 9-21- 43 <https://www.sacred-texts.com/hin/mbs/mbs09021.htm>

the lake, ⁵⁵⁹ (2) Yudhishtira supervised the removal of the royal women from the battle field after seeing off Yuyutsu, ⁵⁶⁰ (3) Duryodhana expressed that he wanted to take rest for that night⁵⁶¹ And (4) the three survivors of the Kaurava army are mentioned again as going to meet Duryodhana. ⁵⁶²

THE FINAL WAR WITH DURYODHANA THUS REMAINED UNFOUGHT ON THE 18TH DAY. The secret meeting between Duryodhana and the three survivors was overheard by a group of hunters who promptly conveyed the location of Duryodhana to Bhima. On hearing this, the Pandava brothers with Krishna quickly reached the lake. This must have been in the next morning.

Here the narrative shifts to **Balarama's pilgrimage**. On the 18th day of the war he was at the sacred waters of Kurukshetra and began to ascend the mountain. But he didn't go very far and spent the night at Plakshaprasavana and Karavapana. The next day he reached a holy spot in Yamuna where he was met by Narada who gave him the details about the war including Duryodhana's flight to the lake and the mace-fight decided between him and Bhima at that very moment.⁵⁶³ Balarama immediately rushed to the spot to meet the warriors. This was the 19th day after the war began.

On the suggestion of Balarama, *the venue of fight was shifted to Samantapancaka*. All of them went by foot to that location. Just when Duryodhana started roaring, calling out Bhima to fight with him, *numerous nimittas of the kind of an aftermath of the comet-hit was once again seen*. Loud thunderbolts, dust showers, hundreds of meteors falling, the earth and the trees trembling, hot winds and mountain tops breaking were seen along with Rahu swallowing the sun in 'aparvan'!!

“rāhuś cāgrasad ādityam aparvaṇi”⁵⁶⁴

Meaning:

Rahus ca = and Rahu

agrasat = swallowed

ādityam = the sun (masculine accusative singular stem: āditya)

⁵⁵⁹ Mahabharata: 9-28-62

⁵⁶⁰ Mahabharata: 9-28-82

⁵⁶¹ Mahabharata: 9-29-17

⁵⁶² Mahabharata: 9-30-4

⁵⁶³ Mahabharata: 9-53-30

⁵⁶⁴ Mahabharata: 9-55-10

aparvani = at the wrong time, out of season (locative case of a-- parvan-)

Overall meaning:

Rahu swallowed the sun out of season.

Unlike the verse of Vyasa on “candrasuryau...caturdasim”, here there is a specific reference to Rahu swallowing the sun, indicating a solar eclipse. The word ‘aparvani’ appeared then (in ‘candrasuryau’ verse) and here also, only to mean that it was either unexpected or occurred defying the calculated time of Amawasya. Figure 40 shows the simulated version for Krodhi, Pushya Amawasya. It exactly matches with Shravana, the star of the day Balarama returned.

Body	Longitude	Nakshatra	Pada												
Lagna	26 Ge 00' 01.26"	Puna	2												
Sun - MK	19 Cp 34' 53.36"	Srav	3												
Moon - PiK	16 Cp 29' 40.26"	Srav	2												
Mars - BK	20 Cp 23' 21.10"	Srav	4												
Mercury - PK	3 Aq 23' 34.64"	Dhan	4												
Jupiter - DK	1 Ta 26' 57.38"	Krit	2												
Venus - GK	3 Sg 17' 09.93"	Mool	1												
Saturn - AmK	28 Cp 55' 53.57"	Dhan	2												
Rahu - AK	0 Le 19' 41.67"	Magh	1												
Ketu	0 Aq 19' 41.67"	Dhan	3												
				Rasi Chart											
				<div> <div> <div>Ke</div> <div>Me</div> <div>Mo</div> <div>Sa</div> <div>Pi</div> </div> <div> <div>Ve</div> <div>SS</div> <div>HL</div> <div>AL</div> <div>Ur</div> <div>OL</div> </div> <div> <div>Ju</div> <div>As</div> <div>Ra</div> <div>Ne</div> </div> </div>											
Date:	November 10, -3136			Vedic Weekday:	Monday (Mo)										
Time:	3:00:00 pm			Nakshatra:	Shravanam (Mo)										
Time Zone:	5:30:00 (East of GMT)				(51.29% left)										
Place:	77 E 12' 00", 28 N 36' 00"			Sunrise:	6:30:18 am										
	New Delhi, India			Sunset:	4:46:00 pm										
Lunar Yr-Mo:	Krodhi - Pushya			Janma Ghati:	21.2375										
Tithi:	Amavasya (Ra) [Chitra]			Ayanamsa:	0-30-46.73										
	(25.72% left)														

Figure 84: The day of Gada-Yuddha (19th day of the war)

By the evening of that day, Duryodhana had fallen. This is known from the verse of Krishna saying that “It is evening; we had better depart to our tents,” soon after the end of the fight.⁵⁶⁵ From the description of the fight it is known that the fight took place in the afternoon. The solar eclipse was seen only in the afternoon. The simulation shows the location of the sun and Ketu well within the required distance of 19 degrees in this simulation, which cannot be true as per the calculation we made for the lunar eclipse of the 3rd day. But it turned out to be aparvani, either because the eclipse was not predicted in advance or it occurred well beyond Pancadasi.

The second factor that the eclipse occurred well beyond the expected time is ascertained by calculating the duration between the lunar eclipse of the 3rd day and the solar eclipse of the 19th day. The eclipse as well as the tithi – either Pournami or Amavasya – end

⁵⁶⁵ Mahabharata: 9-60-63

simultaneously. Immediately after the eclipse the first (next) tithi (Pratipat) starts. *Counting from the rising lunar eclipse on the evening of the 3rd day, 15 days were over by the evening of the 18th day of the war.* Though a day is not equal to a tithi, a paksha would be little less than the 15 day duration. By the evening of the 18th day, 15 tithis were over. The solar eclipse had happened well beyond the time that the normal duration of a paksha gets over. This is very rare – something recognised by Vyasa in his verse, “Caturdaśīm..” **WAS THERE A 16TH TITHI (SODASI) THEN?**

The answer for this is found in **Musala parva** at the time of the destruction of the Vrishnis. This extended phase was remembered by Krishna at that time. Looking at the bad omens seen at that time, Krishna said,⁵⁶⁶

evaṃ paśyan hr̥ṣīkeśaḥ saṃprāptaṃ kālaparyayam
trayodaśyām amāvāsyām tān dr̥ṣṭvā prābravīd idam
caturdaśī pañcadaśī kṛteyaṃ rāhuṇā punaḥ
tadā ca bharate yuddhe prāptā cādya kṣayāya naḥ

Meaning:

evaṃ = thus

paśyan = by seeing (SB 3.1.42, SB 3.9.33) observing (SB 11.22.53) (masculine, nominative, singular, stem: pasyat)

hr̥ṣīkeśaḥ = Krishna

saṃprāptaṃ = saṃprāpta = arrived in time, attained

kālaparyayam = revolution of Time

trayodaśyām = In Trayodasi (dual, instrumental, dative, ablative, ī-stem)

amāvāsyām = Amawasya

tān = that, there (accusative, plural, stem: tad)

dr̥ṣṭvā = having seen, after seeing (BG 1.2)

prābravīd = pra – abravīt = began to speak (SB 9.3.5)

idam = this (neuter, nominative, stem: ayam)

caturdaśī pañcadaśī = caturdaśī pañcadaśī

⁵⁶⁶ Mahabharata: 16-3 -17& 17

kr̥teyaṃ = kr̥ta = made (third person singular tense paradigm injunctive class ātmanepada √kr̥)

iyam = this (nominative singular stem: ayam)

rāhuṇā = by Rahu (instrumental)

punaḥ = again

tadā = at that time

ca = and

bharate yuddhe = in the battle of Bharatas (Mahabharata war)

prāptā = underwent (SB 1.9.13), was attained (SB 3.24.47)

cādyā = ca adya = now

kṣayāya = for destruction (masculine dative singular stem: kṣaya) (BG 16.9, SB 4.29.22)

naḥ = us, to us (accusative genitive case dative case plural of first person pronoun)

Overall meaning:

“By seeing (the adverse omens) Krishna understood that the Time (of wheel) had come to a revolution. Having seen Amawasya in Trayodasi at that time (in the past), he began to speak that Caturdasi made into Pancadasi by Rahu at the battle of the Bharatas is (there) now for our destruction.”

*Krishna compared the solar eclipse at the time of the utterance of this verse by him with the solar eclipse at the time of the Mahabharata war. **BOTH OCCURRED AT EXTENDED TITHIS.** Rahu that made caturdaśī into Pancadasi at the time of the war causing the destruction of the Kuru-s repeated again at that (Krishna’s) time signalling the destruction of the Vrishnis. *The trayodaśī Amawasya therefore didn’t happen again at that time is what is being made out here, which some researchers had missed.* Krishna merely recalled the destruction and the omens at the time of trayodaśī Amawasya.*

THIS VERSE BY KRISHNA, TOLD 35 YEARS AFTER THE MAHABHARATA WAR OFFERS VALIDATION OF THE EXTENDED TITHI COINCIDING WITH A SOLAR ECLIPSE ON THE 19TH DAY OF THE WAR. The 19th day had extended Pancadasi when the solar eclipse had happened. Similar kind of extended tithi swallowed by Rahu had occurred at the time Krishna spoke this. That marked the start of Kali Maha Yuga.

The extended Pancadasi on the 19th day of the war shows that the moon was almost back to its original path by then. From the quick and shorter phases immediately after the comet-hit, the moon had attained a longer path with a slowdown, causing extended tithis. **THIS HAPPENED WITHIN 42 DAY DURATION WHICH WAS EXACTLY THE SAME PERIOD OF BALARAMA'S PILGRIMAGE.** The major disturbances were noticed only within this period. The next major disturbance was at the time of exit of Krishna, which however was a once in a while, rare phenomenon. However, **NEVER AGAIN IN THE HISTORY OF THE WORLD TRAYODASI AMAWASYA OR PAURNAMI WAS REPORTED AND NEVER BEFORE TOO.**

Did Bhishma fail to judge the arrival of Uttarayana?

- The sequence of events explained so far also answers an important question – **why Bhishma failed to know the delay in the arrival of Uttarayana** when he decided to lay down his life on the 10th day of the war?
- Could someone who could calculate diligently the number of extra days spent by the Pandavas in exile, fail to know the arrival of the Uttarayana?
- The answer lies in the **unexpected reduction in the lunar month of Kartika and Margashirsha**. Kartika had a 13-day phase, so too Margashirsha.
- As a result the **Adhika Masa occurred after Pushya, (unusually) in the month of Magha**, thereby pushing forward the Nija masa that is acceptable for religiously important dates such as Uttarayana.
- Bhishma, **busy with the war activities had failed to track the changes in time** on account of the changed conditions of the moon. By the time he realised the change in time, he had already fallen and had no option other than waiting for the adhika masa to pass.

This deduction is possible because of step by step and sequential interpretation of the verses in the Mahabharata. If we look at Figure 84 (reproduced in Figure 85), the lunar month of Magha started the very next day after Duryodhana died. But the sun's longitude doesn't support an adhika masa then, obviously because no simulation (and no manual calculation) can give the exact picture of the time variation then. The fortunate feature is that the astronomy observations that we validated earlier in this chapter were independent of the location of the sun and the moon and were about the aspects (association) between the planets that were in no way affected by the comet-hit. The moon's location (Figure 44 in Chapter 11) changed with reference to the sun only after the comet-hit and in the 42 day period, by which time the war ended.

Body	Longitude	Nakshatra	Pada				
Lagna	26 Ge 00' 01.26"	Puna	2			Gr	Ms
Sun - MK	19 Cp 34' 53.36"	Srav	3			Ju	As
Moon - PiK	16 Cp 29' 40.26"	Srav	2				
Mars - BK	20 Cp 23' 21.10"	Srav	4				
Mercury - PK	3 Aq 23' 34.64"	Dhan	4				
Jupiter - DK	1 Ta 26' 57.38"	Krit	2				
Venus - GK	3 Sg 17' 09.93"	Mool	1				
Saturn - AmK	28 Cp 55' 53.57"	Dhan	2				
Rahu - AK	0 Le 19' 41.67"	Magh	1				
Ketu	0 Aq 19' 41.67"	Dhan	3				

Date:	November 10, -3136	Vedic Weekday:	Monday (Mo)
Time:	3:00:00 pm	Nakshatra:	Sravanam (Mo)
Time Zone:	5:30:00 (East of GMT)		(51.29% left)
Place:	77 E 12' 00", 28 N 36' 00"	Sunrise:	6:30:18 am
	New Delhi, India	Sunset:	4:46:00 pm
		Janma Ghatika:	21.2375
Lunar Yr-Mo:	Krodhi - Pushya	Ayanamsa:	0-30-46.73
Tithi:	Amavasya (Ra) [Chitra]		
	(25.72% left)		

Figure 85: Pushya month ended by the day of Duryodhana's fall

The next day (11th November) was the first day of Magha. To have this month as Adhika masa, the sun must have been at the beginning of Capricorn –by having just entered the sign. This is the original time of the Uttarayana then, but the calendar system of the Mahabharata times did not propose the exact time of the turn of the sun in the years other than the 1st year of the Yuga. That year being the 2nd in the 5- year Yuga, **the 13th tithi of Magha was the day of Uttarayana**. But by then they witnessed the lunar month starting after the sun entered Capricorn and ending before the sun exited Capricorn. This made *this lunar month of Magha an Adhika masa*

This duration shows that the SUN HAD ADVANCED INTO CAPRICORN AND ENTERED AQUARIUS SOON AFTER THE NIJA MAGHA BEGAN. *By the time of Uttarayana in Nija Magha the sun could be seen in Aquarius*. We will check this in the simulator in due course.

In the normal course, the 13th tithi of Magha was the day of Uttarayana in the 5 year Yuga in vogue then (Figure 48). That tithi coming in the adhika masa, Vyasa, preferred to wait till the Nija masa started, but then he seemed to have calculated the Uttarayana of Nija Magha by just deducting the four tithis lost in the two phases after the comet-hit. Overall this made him wait for 58 days for his exit. This duration can be cross-checked by constructing the tithi-nakshatra alignment in the reverse from Bhishma Nirvana for 58 days to locate the date of the commencement of the Mahabharata war.

Nilesh Oak's views on Bhishma Nirvana.

Before proceeding further let me highlight the views of Nilesh Nilkanth Oak on Bhishma nirvana.

(1) He “wholeheartedly” **accepts his inability to corroborate** the Mahabharata observations on “58 days time interval between ‘Fall of Bhishma’ and ‘Bhishma Nirvana’” and the start of the Uttarayana at the end of 58 days.⁵⁶⁷

(2) According to him Magha Shuddha Ashtami- Rohini reference is an **interpolation**.

(3) He also says that “**if one adds the spice of ‘Adhika masa’** (extra lunar month inserted periodically to align lunar and solar calendars), the time interval would stretch up to 3000 -4000 years.”⁵⁶⁸

(4) He uses **tropical zodiac calendar** of the Voyager simulator to arrive at the date of Bhishma Nirvana (winter solstice / Uttarayana).

(5) He believes that Bhishma was lying on the **bed of arrows for 98 days**, and not 58 days as given in the text (all editions). He wonders whether it was originally ‘Ashta-navatee’ modified in later times as ‘Ashta-pancha-shatam’.⁵⁶⁹

(6) He **adjusts the number of days to match with the Uttarayana shown by the simulator**. This adjustment includes unproven duration of the stay of Pandavas on the bank of Ganga and a faulty estimation of the number of days when the Pandavas received guidance from Bhishma on arrow bed. He asserts that Bhishma was lying on arrow bed for 98 nights.⁵⁷⁰

Three verses on Bhishma's waiting period.

Bhishma's waiting period is indeed a crucial input for arriving at the date of Mahabharata war. Mahabharata text had three verses spoken by three important persons on the duration of the waiting period of Bhishma. Contextual analysis of these verses reveals the number of days besides something more than what meets the eye. The revelation gained through these verses helps us in validating the date of Mahabharata derived earlier.

⁵⁶⁷“When Did The Mahabharata War Happen?” Page 140

⁵⁶⁸“When Did The Mahabharata War Happen?” page 138

⁵⁶⁹Ibid. Page 138

⁵⁷⁰Ibid. Page 138

1. Krishna assigned “remaining 56 days” for Bhishma.

After installing Yudhishtira in the throne, Krishna suddenly went into meditation, invoked by Bhishma from the arrow bed.⁵⁷¹ Immediately he started off along with the Pandavas and a huge entourage of army and reached the battle field where Bhishma was lying. There Krishna made the following statement.

pañcā śataṃ ṣaṭ ca kurupravīra; śeṣaṃ dinānāṃ tava jīvitasya
tataḥ śubhaiḥ karmaphalodayais tvaṃ; sameṣyase bhīṣma vimucya deham (12-51-14)

Ganguli’s translation: “*Six and fifty days, O foremost one of Kuru's race, still remain for thee to live! Casting off thy body, thou shalt then, O Bhishma, obtain the blessed reward of thy acts.*”

This is interpreted by many that Bhishma was left with 56 days to cast off his body. A word for word meaning of this verse shows this is flawed.

There is no issue with the first part “pañcā śataṃ ṣaṭ ca kurupravīra” – “fifty six days, O foremost one of Kuru's race.” The remaining part starting from “śeṣaṃ dinānāṃ tava jīvitasya” does not mean that he was left with 56 days.

śeṣaṃ = remaining, balance (masculine, accusative, stem: śeṣa)

dinānāṃ = in the days (masculine, genetiv plural, stem: dina)

tataḥ = of it (SB 10.83.23) masculine ablative plural stem: tad

śubhaiḥ = of the auspicious (BG 12.17) (masculine, instrumentative, plural, stem: śubha)

karmaphalodayais = karmaphala udayais

karmaphala = the fruit of actions

udayais = going up, arising (masculine, instrumentative, plural, stem: udaya)

tvaṃ = your (2nd person pronoun, accusative)

sameṣyase = sameṣyanti = will all come (SB 10.70.42), will enter simultaneously (SB 12.2.24)

bhīṣma = Bhishma

vimucya = being delivered from (BG 18.51-53)

deham = body (masculine, accusative, singular)

⁵⁷¹ Mahabharata: 12-45- 20, 12-46-11

Overall meaning:

“The foremost of the Kuru’s race, fifty six days; in the remaining days of it, your auspicious karma-phala (is going to) arise simultaneously while being delivered from your body”

What is this auspicious karmaphala that is going to arise then, that Krishna was referring to? It was what he was going to get by imparting his knowledge to the Pandavas in those remaining days. So there is no reference to 56 as the number of ‘remaining days’.

Contextual analysis: On reaching the place where Bhishma was lying, Krishna asked Bhishma to remove Yudhishtira’s grief over the great slaughter of his kinsmen, by giving him knowledge. Overwhelmed by this request by Krishna, Bhishma started to praise him in his various cosmic forms and confided that he saw his Divya Rupa (Vishvarupa)⁵⁷²— alluding to the Cosmic Form of Krishna seen by Arjuna during Gitopadesa. Then Bhishma offered surrender (*prapannāya bhakti*) unto Krishna.⁵⁷³

Krishna accepted Bhishma’s devotion (*parā bhakti*) and conceded that he did show his Divya rupa to Bhishma.⁵⁷⁴ This conveys that in addition to Arjuna and Sanjaya, Bhishma also had seen the Vishvarupa of Krishna and had heard Krishna’s words. And the words that Krishna spoke in his Cosmic form contained the following information.

mayaivaite nihatāḥ pūrvam eva; nimittamātraṁ bhava savyasācin
dronaṁ ca **bhīṣmaṁ** ca jayadrathaṁ ca; karnaṁ tathānyān api yodhavīrān
mayā hatāms tvam jahi mā vyathiṣṭhā; yudhyasva jetāsi raṇe sapatnān
(6-33- 33b & 34)

Ganguli’s translation: “By me have all these been already slain. Be only (my) instrument. O thou that can’t draw the bow with (even) the left hand. Drona and **Bhishma**, and Jayadratha, and Karna, and also other heroic warriors, (already) **slain by me**, do thou slay.”

To relieve Arjuna from the vexatious predicament of killing the elders, teachers and relatives, Krishna in Cosmic form assured Arjuna that he killed Bhishma, Drona, Jayadratha and Karna! So technically and in God’s (Krishna) account, Bhishma was killed on the day before the war began – the day Krishna imparted Bhagavad Gita – on Pushya Shukla Ekadasi when the sun was in Margashira. Since Krishna, the Cosmic Being had killed Bhishma even before the war started, Arjuna need not think that he was going to kill Bhishma; he was going to kill him and others who were already killed by Krishna. Arjuna could remain only as a weapon in

⁵⁷²Mahabharata: 12-51- 5 to 8 <http://www.sacred-texts.com/hin/mbs/mbs12051.htm>

⁵⁷³Mahabharata: 12-51-9

⁵⁷⁴Mahabharata: 12-51-10

Krishna's hands. These words of Krishna must have been heard by Bhishma when he saw the Vishvarupa of Krishna.

Krishna acknowledged Bhishma's version of seeing the Vishvarupa, by saying that he did show his Cosmic Form to him. It was then Krishna asked Bhishma to increase his karma-phala in the remaining days of the 56 days by imparting his knowledge to the Pandava brothers to dispel their grief. Coming in the context of the talk of Krishna's Cosmic Form revealed to Bhishma, the entire duration was 56 days from the day Bhishma was killed by Krishna when he imparted Gita—i.e. from the first day of the war and not from the 10th day of war when Bhishma chose to lie down on the bed of arrows.

2. Yudhishtira found very 'few days remaining' for Bhishma.

Just a few days after the above talk by Krishna, Yudhishtira told Bhishma that “only few days are now remaining for the day of winter solstice (and thus for Bhishma Nirvana)”

⁵⁷⁵ The verse runs as follows:

śeṣam alpam dinānām te dakṣiṇāyana bhāskare
āvṛtte bhagavatya arke gantāsi paramām gatim (12-291-4)

In Ganguli's words, “*Thou hast very few days to live. When the Sun turns from the southern path for entering into the northern, thou shalt attain to thy high end.*”

‘Alpam’ is the main word here, conveying the meaning, little (SB 3.30.15), small (SB 10.66.7), meagre (SB 1.1.10), insufficient (SB 10.53.23) etc.

Contextual analysis: Yudhishtira kept asking many questions to Bhishma and Bhishma was replying him patiently in spite of the pain and discomfiture he was experiencing. At one stage, Yudhishtira felt bad for troubling him and said that since only a very few days (alpam sesham) were left for Bhishma to attain the higher realms, and with none else to clarify his questions, he had been asking Bhishma those questions.

How many days could be meant by “**śeṣam alpam dinānām**”? According to Nilesch Oak 50 more nights were there after the end of this interaction between Bhishma and the Pandavas. Nilesch Oak has picked out the verse “uṣitvā śarvarīḥ śrīmān pañcāśan”⁵⁷⁶ as indicative of the number of nights (pañcāśan = 50) Yudhishtira spent in Hastinapur before he left to give farewell to Bhishma.

⁵⁷⁵ “When Did The Mahabharata War Happen?” Page 136

⁵⁷⁶ Mahabharata: 13-153-5 <http://www.sacred-texts.com/hin/mbs/mbs13153.htm>

The conversation between Bhishma and the Pandavas occurred in the preceding six days, in Nilesch Oak's scheme. Let me analyse this later along with "pañcāśan" and continue now with the third reference on the number of days of the waiting period.

3. Bhishma declared that he waited for '58 nights'

On the day the sun turned towards north in the month of Magha the Pandavas and others returned to Kuruskhetra to see off Bhishma leaving for higher realms. At that time Bhishma told them that he waited for 58 nights. This number having been spelt by the very person who endured the suffering, no researcher can afford to dismiss this and arrive at a number different from this. Nilesch Oak's derivation of 98 days is rejected straight away on the strength of this primary evidence. Bhishma's version is as follows:

aṣṭa pañcāśataṃ rātryaḥ śayānasyādyā me gatāḥ
śareṣu niśitāgreṣu yathā varṣaśataṃ tathā (13-153-27)

Ganguli translates this as "I have been lying on my bed here for eight and fifty nights. Stretched on these sharp-pointed arrows I have felt this period to be as long as if it was a century."

aṣṭa pañcāśataṃ = eight and fifty (fifty eight)

rātryaḥ = night (feminine, nominative, plural, stem: rātri)

Śayānasya = sleeping, lying down (SB 1.3.2) (masculine, genitive, singular, stem: śayāna).

Adya = now

Me = to me (deictic, dative, genitive, singular stem: asmad)

gatāḥ = expired (Monier-Williams, Sir M. (1988)) (masculine, nominative, plural, past passive participle, stem: gata)

śareṣu: the arrows (SB 11.30.20) (masculine, locative, plural, stem: śara)

niśita = sharpened

agreṣu: tip (masculine, locative, plural, stem: agra)

yathā = according as, in order that, as if

varṣaśataṃ = 100 years

tathā – in that manner, so, thus

Overall meaning:

“Fifty eight nights of sleeping expired now; to me as if 100 years on the sharpened arrows”.

Bhishma spent 58 nights, but the arrows made him feel like 100 years. There can be a combined reading or a separate reading in which case, it would mean that he spent 58 nights in the battle field, but his time on the arrow bed made it like 100 years. This split up is because he started lying on the arrow bed only from the 10th day of the war whereas he had been spending his nights in the Kuru camp in the battlefield from before the Gitopadesa day when he overheard Krishna’s counsel to Arjuna.

The number of days is almost close to Krishna’s number of 56 days counted from the beginning of the war. There are two solid references one from Krishna and another from Bhishma – both having spelt the numbers in the presence of Vyasa, the author of Mahabharata. So there is no way to assume that there is discrepancy between the two versions – that Bhishma meant 58 days while Krishna, 56 days. If there is any discrepancy Vyasa could have cleared the air, but that he didn’t specify anything goes to prove that both numbers referred to the same duration, perhaps counted in different time units, say in tithi or nakshatra or solar risings. So my first attempt for clarification is to reconstruct the 58 days in the reverse order from Shuddha Magha Shukla Ashtami.

Month- Tithi-Nakshatra alignment for 58 days.

To know when exactly the first day of the 58-day period commenced, let me construct the tithi-star alignment from the known alignment on the day of Bhishma Nirvana to the first day. The known alignment is Magha Shukla Ashtami coinciding with Rohini.

Bhishma Nirvana	S-8	Rohini		29 S-8	Aswini
	58 S-7	Krittika		28 S-7	Revati
	57 S-6	Bharani		27 S-6	U-Bhadra
	56 S-5	Aswini		26 S-5	P-Bhadra
	55 S-4	Revati		25 S-4	Satabhi
	54 S-3	U-Bhadra		24 S-3	Dhanishta
	53 S-2	P-Bhadra		23 S-2	Shravana
Magha Shuddha	52 S-1	Satabhish	Magha Adhika	22 S-1	U-Shada
	51 Amavasya	Dhanish		21 Amavasya	P-Shada
	50 K-14	Shravna		20 K-14	Moola
	49 K-13	U-Shada		19 K-13	Jyeshtha
	48 K-12	P-Shada		18 K-12	Anuradha
	47 K-11	Moola		17 K-11	Vishaka
	46 K-10	Jyeshtha		16 K-10	Swati
	45 K-9	Anuradha		15 K-9	Chitra
	44 K-8	Vishaka		14 K-8	Hasta
	43 K-7	Swati		13 K-7	U-Phal
	42 K-6	Chitra		12 K-6	P-Phal
	41 K-5	Hasta		11 K-5	Magha
	40 K-4	U-Phal		10 K-4	Aslesha
	39 K-3	P-Phal		9 K-3	Pushya
	38 K-2	Magha		8 K-2	Punarvasu
	37 K-1	Aslesha		7 K-1	Ardra
	36 Purnami	Pushya	Lunar eclipse	6 Purnami	Mriga
	35 S-14	Punarvasu		5 S-14	Rohini
	34 S-13	Ardra		4 S-13	Krittika
	33 S-12	Mriga		3 S-12	Bharani
	32 S-11	Rohini	Gitopadesa	2 S-11	Aswini
	31 S-10	Krittika	Pushya Month	1 S-10	Revati
	30 S-9	Bharani			

Figure 86: 58 days of Bhishma Nirvana with star-tithi

The biggest revelation of this reverse counting is that 58 or 56 day period **DID NOT BEGIN ON THE 10TH DAY OF THE WAR WHEN BHISHMA FELL**. It started from the beginning of the war.

The number of days pertains to solar risings (solar days). Bhagavad Gita was rendered on the 2nd day in this table. Krishna having killed Bhishma on that day, the remaining days turned out to be only 56!

1. Points of synchronisation:

1. The first day falls in Pushya month. This concurs with my derivation of month-wise sequences done in previous pages that *the war must have started in Pushya month*. It didn't start in Margashira or in Kartika that Niles Oak thinks.

2. Pournami occurred in the beginning of this list of days concurring with the scope *for lunar eclipse rising with horns pointing downwards*.

3. The counting of Bhishma's waiting period includes the entire war period. This is close to the count-down that *started from the time of Gitopadesa* that I interpreted from Krishna's version.

2. Points of non-synchronisation.

1. **Shukla Ekadasi**, the traditional date of Gita Jayanti comes **within the initial period** of this data.

2. The **18 day war period** doesn't synchronise with the date after **Shukla Ekadasi** (Gita Jayanti).

3. **Purnami coincides with Mrigashirsha** in the above table whereas it should have been on Punarvasu.

The **NON-SYNCHRONISATION IS DUE TO THE VARIANCE OF TITHI-STAR ALIGNMENT**. The moon makes 62 synodic revolutions and 67 star rounds in the 5 year Yuga. As a result to cross a star, the moon takes 1.028 tithi.⁵⁷⁷ The 1st day of the war is reproduced here to show that **ROHINI COINCIDED WITH SHUKLA DWADASI AND NOT SHUKLA CATURDASI**. (Figure 87)

Body	Longitude	Nakshatra	Pada				
Lagna	25 Cp 18' 41.46"	Dhan	1				
Sun - DK	0 Cp 55' 40.26"	USha	2				
Moon - BK	22 Ta 59' 49.57"	Rohi	4				
Mars - PiK	5 Cp 58' 47.27"	USha	3				
Mercury - PK	3 Cp 45' 39.68"	USha	3				
Jupiter (R) - GK	1 Ta 15' 19.47"	Krit	2				
Venus - MK	19 Sc 38' 09.99"	Jye	1				
Saturn - AmK	26 Cp 45' 00.22"	Dhan	2				
Rahu - AK	1 Le 17' 49.55"	Magh	1				
Ketu	1 Aq 17' 49.55"	Dhan	3				

Date:	October 23, -3136	Vedic Weekday:	Thursday (Ju)
Time:	8:00:00 am	Nakshatra:	Rohini (Mo) (2.52% left)
Time Zone:	5:30:00 (East of GMT)	Sunrise:	6:21:33 am
Place:	77 E 12' 00", 28 N 36' 00"	Sunset:	4:29:26 pm
	New Delhi, India	Janma Ghatika:	4.1018
Lunar Yr-Mo:	Krodhi - Pushya	Ayanamsa:	0-30-49.44
Tithi:	Sukla Dwadasi (Me) [Vijaya] (16.09% left)		

Figure 87: The first day of the war

The presence of two tithis seen in the above simulation is a case of **Tithi Dvayam** that leads to a kshaya tithi. This is to imply that there was tithi-solar day mismatch and star-solar day mismatch within the 58 day reverse data.

⁵⁷⁷ No of synodic revolutions in 5 years = 62 (62 x 30 = 1860 tithi)
 No of sidereal revolutions of the moon = 67 (67 x 27 = 1809 stars)
 1809 stars = 1860 tithis, therefore 1 star = 1860 / 1809 = 1.028 tithi

The re-aligned Tithi-nakshatra- month for the first few days covering the 18 day Mahabharata period is produced below. It perfectly concurs with Mahabharata version of Shravana nakshatra when Balarama returned. **SHRAVANA WAS AT SUN RISE ON THE 19TH DAY WHEN THE MACE- FIGHT TOOK PLACE.** This re-alignment is done by matching Rohini- Mrigashirsha with Shukla Dwadasi (S-12) –Trayodasi (S-13) as noticed in the simulator.

Bhish-Nir	Tithi	Star	Actual	War days
23	S-3	Shravana		
22	S-2	U-Shada		
Amavasya	1	P-Shada	Shra+Shata	19 Gada Yuddha
20	Amavasya	Moola	Utt+Shra	18 Shravana
19	K-14	Jyeshtha	Pur+Uttr	17
18	K-13	Anuradha	Moo+Pur	16
17	K-12	Vishaka	Jye+Moo	15
16	K-11	Swati	Anu +Jye	14 Late Moon-rise
15	K-10	Chitra	Vis+Anu	13
14	K-9	Hasta	Swa + Vis	12
13	K-8	U-Phal	Chi +Swa	11
12	K-7	P-Phal	Has+ Chi	10 Fall of Bhishma
11	K-6	Magha	U.P+ Has	9
10	K-5	Aslesha	P.P+U.P	8
9	K-4	Pushya	Mag +P.P	7
8	K-3	Punarvasu	Asl +Mag	6
7	K-2	Ardra	Push + Asle	5
6	K-1	Mriga	Pu+Push	4
5	Purnami	Rohini	Aru + Pu	3 Eclipse
4	S-13+14	Krittika	Mri +Aru	2
3	S-12+13	Bharani	Roh +Mri	1 War started
2	S-11	Aswini	Kri +Roh	Gitopadesa
1	S-10	Revati		

7 Days
gap as per
nimitta

Figure 88: The war period synchronised with star-tithi

The above table incorporating the re-aligned tithi- nakshatra **PERFECTLY MATCHES WITH THE 3rd day Full moon (lunar eclipse), the fall of Bhishma on the 10th day (WHEN HE STARTED LYING DOWN ON THE ARROW BED) AND the Gada Yuddha in Shravana THAT COINCIDED WITH THE END OF BALARAMA'S PILGRIMAGE.**

Body	Longitude	Nakshatra	Pada								
Lagna	2 Cn 21' 19.44"	Puna	4					Ju			
Sun - GK	10 Cp 27' 25.47"	Srav	1	As				A3		A2	
Moon - PiK	18 Vi 00' 23.31"	Hast	3	BL				Rasi			
Mars - PK	13 Cp 18' 00.05"	Srav	1	Ke							
Mercury - MK	19 Cp 36' 32.75"	Srav	3	A11							
Jupiter - DK	1 Ta 12' 30.62"	Krit	2	Ma Me Su Sa							
Venus - BK	25 Sc 55' 09.52"	Jye	3	Sa				SS		Ra	
Saturn - AmK	27 Cp 50' 56.20"	Dhan	2							UL	
Rahu - AK	0 Le 48' 09.89"	Magh	1	PP		AL		HL		Ne	
Ketu	0 Aq 48' 09.89"	Dhan	3	As		A4		A7		A6	
				Ve						Mo	

Date:	November 1, -3136		
Time:	4:00:00 pm		
Time Zone:	5:30:00 (East of GMT)		
Place:	77 E 12' 00", 28 N 36' 00"		
	New Delhi, India		
Lunar Yr-Mo:	Krodhi - Pushya		
Tithi:	Krishna Shashthi (Ve) [Vajreswari]		
	(37.09% left)		

Vedic Weekday:	Saturday (Sa)
Nakshatra:	Hastha (Mo)
	(39.95% left)
Sunrise:	6:26:11 am
Sunset:	4:36:19 pm
Janma Ghatis:	23.9090
Avanamsa:	0-30-48.06

Figure 89: The day of fall of Bhishma

The simulation matches with **Hasta**, the star of the day, though Shashthi tithi was still running. Earlier we pointed out **12 hour difference between the actual time at the end of the tithi (and the lunar eclipse)** on the 3rd day of the war and the simulated version, caused by an anomaly in the speed of moon. By that difference, it is theorised that Shashthi almost ended at the time of Bhishma's fall, followed by Saptami.

The late moon-rise on the night of the 14th day of the war.

The next event was the late moon-rise on the night of the 14th day. The tithi can be counted from the time of the eclipsed Full- Moon that rose up on the evening of the 3rd day of the war (Figure 36). That was the evening of 25th October 3136 BCE. The 10th day of the war happened to be 1st November when Bhishma fell (Figure 89). The 14th day coincided with 5th November. Counting the tithis from Krishna Pratipat that started at the night of the 3rd day of the war (25th October) till the midnight of the 14th day (5th November), eleven tithis must have passed. At the time of late moon rise, the warring people must have seen either the **end of Krishna Ekadasi** or the **beginning of Krishna Dwadasi**. This sighting happened in the early hours, say around 3 AM of 6th November 3136 BCE.

The day break on the 15th day must have coincided with Krishna Dwadasi. This sequence justifies **extended tithis culminating in Amawasya stretching to the 19th day** – something Krishna recalled 35 years later.

1. The rationale of Krishna's 56 days:

Starting from the day after Gitopadesa (when Krishna claimed he killed Bhishma) Bhishma lived for 56 days as per the table in Figure 42. A counter to this may be quoted from the verses uttered by Krishna at the cremation of Bhishma.⁵⁷⁸ The Goddess of river Bhagirathi (Ganga), the mother of Bhishma was grief stricken at the death of her son Bhishma. Krishna consoled her by telling that *Bhishma was not killed by anyone!* He remained alive till he decided to cast off his body. This seems to run contradictory to Krishna's claim during Vishvarupa that it was he who killed Bhishma. Since Bhishma was invincible until he decided to write on his own his time of death, Krishna's words make better sense that the countdown for Bhishma Nirvana started at the time of Vishvarupa.

2. Bhishma's 58 days:

- If we count from the first day of the war, Rohini was at sunrise. On the day of Uttarayana when Bhishma left it was again Rohini. In between only 54 stars had passed. Therefore *Bhishma's count was not star-based.*
- If we count the tithis, there are *57 tithis starting from the night of Shukla Ekadasi*, on the day of Gitopadesa till the night of Magha Shukla Saptami.
- If we count the tithis from the previous night when *Pushya Shukla Dasami was running, there are 58 tithis.* Starting the count from that time is justifiable on an important war-related activity.
- Bharani was the star of the day then. Bharani is very well known for doing war commencement Homa (**Rana yajna**)!
- There is ample evidence in Tamil literature for symbolically starting the war on Bharani day by offering sacrifices to Pishaca (vampire) on that day. A separate literature called 'Bharani' literature is found in Tamil exclusively on war feats of the kings. The Chola King Kulottunga I's Kalinga war was written as 'Kalingatthu Bharani' (The Bharani of Kalinga) in the form of a conversation among the vampires waiting for food, i.e. the bodies of the dead soldiers. Yet another popular Bharani in Tamil was on Daksha's yajna, known as 'Dakka Yāga Bharani' (The Bharani of Daksha). This tradition, popular in the past must have been followed in any war including the Mahabharata war.⁵⁷⁹ The commencement of the war occurring closer to Bharani strengthens this view. The re-aligned initial days of the war is shown below.

⁵⁷⁸ Mahabharata: 13- 154- 29 to 31 <http://www.sacred-texts.com/hin/mbs/mbs13154.htm>

⁵⁷⁹ Stealing the cattle as a prelude to attack a country and war dances were common throughout Bharatavarsha. They are incorporated as war traditions in the Tamil Grammar work called "Tol Kappiyam." Bharani yajna is part of that tradition. Therefore it is presumed that Mahabharata war started with Bharani Yajna. Sacrifices were made at that yajna. Folklore in Tamil refers to Iravan, born to Ulupi and Arjuna as the one sacrificed at this

5	Purnami	Rohini	Aru + Pu	3	
4	S-13+14	Krittika	Mri +Aru	2	
3	S-12+13	Bharani	Roh +Mri	1	War started
2	S-11	Aswini	Kri +Roh		Gitopadesa
1	S-10	Revati	Bharani+Kr		Bharani Homa

Figure 90: The days before the war began

Bhishma as the chief Commander must have participated in Bharani Homa and was present in the war field right from the night of Shukla Dasami. Counting from that tithi, **HE HAD SLEPT IN THE WAR FIELD FOR 58 TITHIS (TILL MAGHA SHUKLA SAPTAMĪ)** enduring the hardships of the war field.

An overwhelming revelation is that the *waiting period covered the entire war period.*

The tithi-star-month alignment does not support counting of Bhishma's waiting period from the 10th day of the war.

A last issue remains to be cleared.

Did *Yudhishtira spend 50 nights* in Hastinapur after meeting Bhishma? To decipher this we must start from when Yudhishtira started spending his nights in Hastinapur. In other words, we must establish the time he was crowned.

The coronation of Yudhishtira.

Duryodhana was killed on the evening of Pushya Amawasya that coincided with a solar eclipse in Shravana (Figure 41). Magha adhika masa started the next day. Vaisampayana says,

*“Having offered oblations, of water unto all their friends and kinsmen, the sons of Pandu, and Vidura, and Dhritarashtra, and all the Bharata ladies, continued to dwell there (on the banks of Bhagirathi). The high-souled sons of Pandu desired to pass the period of mourning, which extended **FOR A MONTH**, outside the Kuru city.”⁵⁸⁰*

This *one month was of the entire duration of the adhika masa*. The Pandava clan spent the entire Adhika Masa near the sacred waters doing the prescribed oblations for the dead. Coronation cannot be done in Adhika masa.

The text says upon the completion of a month, the sages including Narada, Vyasa, Kanva and others visited Yudhishtira. This must have been on Shukla Pratipat of Nija Magha.

yajna done before the war. However Mahabharata does not support this view but describes Iravan's fight and death on the 8th day of the war.

⁵⁸⁰ Mahabharata: 12-1-2

Yudhishtira remained inconsolable despite the advice by the sages. At last after Krishna's counsel to seek the advice of Bhishma, Yudhishtira agreed to return to the city and take up the crown.

The text immediately jumps into the description of the Pandavas entering the city and Yudhishtira getting crowned.⁵⁸¹ This must have been on **SHUKLA DWITIYA**, a day auspicious for coronation.⁵⁸² The rising lagna at the **FIXED SIGN OF TAURUS** with Jupiter located there, and **THE MOON IN UTTARA BHADRAPADA** and the sun in the 10th seem ideal for the coronation around 11 AM on that day. (Figure 47) The week day happened to be a Thursday and the date turns out to be 11th December, 3136 BCE. The celebration of 'Jaya' must have started then with the learned expressing, "svasty ūcur jayam".⁵⁸³

Body	Longitude	Nakshatra	Pada
Lagna	21 Ta 39' 29.04"	Rohi	4
Sun - AK	20 Aq 44' 43.78"	PBha	1
Moon - MK	6 Pi 22' 46.99"	UBha	1
Mars - AmK	15 Aq 05' 39.21"	Sata	3
Mercury (R) - BK	14 Aq 54' 51.75"	Sata	3
Jupiter - PiK	4 Ta 14' 08.26"	Krit	3
Venus - PK	4 Cp 07' 24.04"	USha	3
Saturn - GK	2 Aq 42' 00.48"	Dhan	3
Rahu - DK	28 Cn 41' 41.20"	Asre	4
Ketu	28 Cp 41' 41.20"	Dhan	2

Date:	December 11, -3136	Vedic Weekday:	Thursday (Ju)
Time:	11:00:00 am	Nakshatra:	Uttarabhadra (Sa) (77.15% left)
Time Zone:	5:30:00 (East of GMT)	Sunrise:	6:33:26 am
Place:	78 E 01' 00", 29 N 10' 00"	Sunset:	5:25:33 pm
	Hastinapur, India	Janma Ghati:	11.1070
	Nija Magha	Ayanamsa:	0-30-42.18
Lunar Yr-Mo:	Krodhi - Phalguna		
Tithi:	Sukla Dwitiya (Mo) (Bhaga Ma)		
	(69.71% left)		

Figure 91: The date of coronation of Yudhishtira

Immediately following the coronation, Yudhishtira performed Shraddha rites for the sake of his own sons and others killed in the war and made huge donations as part of those rites.⁵⁸⁴ This once again is proof for the Adhika masa just following the war. The Upapandavas were killed on the night of the 19th day following the fall of Duryodhana by which time the Adhika masa had started.⁵⁸⁵ Only death related Shraddha rites can be done in Adhika masa and the other rites including charity must be done in the Nija masa. That they were performed only

⁵⁸¹ Mahabharata: 12-40 <https://www.sacred-texts.com/hin/mbs/mbs12040.htm>

⁵⁸² Dr.B.V.Raman, "Muhurtha", p. 135

⁵⁸³ Mahabharata: 12-40-18

⁵⁸⁴ Mahabharata: 12 – 42 <https://www.sacred-texts.com/hin/mbs/mbs12042.htm>

⁵⁸⁵ Immediately after the end of Amawasya or the solar eclipse, the new month starts. By the evening of the 19th day the solar eclipse was already over and so the next month / Pratipat tithi started by the evening of the 19th day.

after a month is a proof for the Adhika masa running in the one-month period when the Pandavas were staying near the Bhagirathi River.

The text continues to state that on the next morning after the coronation, Krishna went into a trance while Bhishma was praising him from the arrow bed. This was followed by Krishna taking them all to Kurukshetra where Bhishma was lying. This was on Magha Shukla Tritiya.

Sequencing the days since Bhishma started imparting knowledge to the Pandavas.

It is important to sequence the days right from the time Bhishma started imparting his knowledge to the Pandavas, for, here lies Nilesch Oak's justification for extra 56 days, amounting to 98 days in his scheme of Bhishma's waiting period. According to Nilesch Oak, the conversation with Bhishma lasted for 6 days starting from the day Krishna said that Bhishma was left with 56 days more (already solved). The next 50 days (nights) were spent by Yudhishtira in the capital city. A day after that Bhishma departed the world in Nilesch Oak's scheme. Let me analyse the sequence step by step to establish the exact number of days.

It all started on a day (the day after the coronation of Yudhishtira) in the arrow bed when Bhishma did a “**Vāg Yajna**”⁵⁸⁶ (Yajna by speech) of praising the Cosmic Form of Krishna. Hearing this yajna by his Yogic power, Krishna bestowed upon him the knowledge of the past, present and future. Then Krishna suddenly rose from his seat and ascended his chariot and reached Kurukshetra followed by the Pandavas and others.

Day 1 of the conversation with Bhishma (Magha Shukla Tritiya).

On seeing Krishna, Bhishma started praising him in his Cosmic Form and said that he had seen his Vishvarupa. Krishna did acknowledge that he did show him his Vishvarupa. A question may arise here when did Bhishma see the Vishvarupa – was it at the time of Gitopadesa or on the very same day that Krishna was meeting him on the arrow bed? This question arises because Mahabharata text shows him praising Krishna in Cosmic form before Krishna started off to meet him.

If he had seen the Vishvarupa on that day, then the justification given by me for 56 days (starting from Vishvarupa during Gitopadesa) would become invalid. So this necessitates a clarification.

⁵⁸⁶ Mahabharata: 12-47-63 “vāg yajñenārcito devaḥ prīyatām mejanārdanaḥ” <http://www.sacred-texts.com/hin/mbs/mbs12047.htm>

- It is clarified here that Bhishma had only done the “Vāg Yajna” on that day by recollecting the **Vishvarupa** seen by him at the time of Gitopadesa. Vyasa says that Bhishma thought of Krishna in mind, word and act and “with a cheerful and strong voice he hymned the praise of the slayer of Madhu”
- He has recollected what he had seen **at the time of Gitopadesa** and praised the Cosmic Form with Vāg Yajna. He as the commander of the opponent army could not have expressed his mind at the time of seeing the Vishvarupa – a response that Arjuna was able to do then and there. But later on when he was lying on the arrow bed, he recalled what he saw and expressed it as a hymn of praise of Krishna’s Cosmic Form.
- His praise has reached Krishna who in turn bestowed him the knowledge. Following this Krishna started off to see him. During the one-to-one conversation with Krishna, Bhishma offered **Prapatti** (surrender) and Krishna accepted it. In this context Krishna made a mention about 56 days which was explained earlier.
- Krishna ordained Bhishma to **share his knowledge with the Pandavas** in the remaining days. Bhishma willingly obliged, but no sharing of knowledge started on that day. This was on Magha Shuka Tritiya.
- The sun was seen to descend in the west and the rishis (Sapta rishi-Ursa Major) were rising up – indicating sunset.⁵⁸⁷ Seeing **the setting sun**, Krishna and others took leave of Bhishma after circumambulating him.
- They speeded up in their chariots leading in the front with the foot soldiers coming in the rear - described as the two currents of Narmada River divided by Rikshavat Mountains. The most important feature comes here – that **the moon appeared before them!**

“tataḥ purastād bhagavān niśākarāḥ; samutthitas tām abhiharṣayaṁś camūm”⁵⁸⁸

Meaning:

tataḥ = in that place, there

purastād= purás-tād = forward, before, in front.

niśākarāḥ = night maker, the moon

samutthitaḥ = appeared (SB 7.8.19-22), arose (SB 4.14.38)

tām: in this manner (feminine accusative singular stem: tad)

⁵⁸⁷ Mahabharata: 12- 52. V 26 & 27

tato muhūrtād bhagavān sahasrāmśur divākarāḥ
dahan vanam ivaikānte pratīcyāṁ pratyadṛśyata
tato maharṣayaḥ sarve samutthāya janārdanam

⁵⁸⁸ Mahabharata: 12-52-33

abhi = to, towards, into, over, upon

harṣaya = causing pleasure (SB 6.10.13-14) (second person singular present causative imperative class parasmaipada √hr̥ṣ)

Overall meaning:

“The moon appeared there before them causing pleasure.”

The 3rd phase moon (which is already in the western sky) would become visible soon after sunset. This was sighted by the Pandavas and Krishna.

2. Day 2 of the conversation with Bhishma (Magha Shukla Caturthi)

- The Pandavas and Krishna left for Kurukshetra without the accompaniment of the army. On the return journey they stopped at **Drishadvati** and performed their ‘Sandhya’ according to Nilesch Oak.⁵⁸⁹ He missed the crucial references to something else in the text and merely assumed that Sandhyopasana was done by the Pandavas and Krishna.
- The context is this: Bhishma **was ready to continue** the conversation and asked what more they wanted to know.
- Yudhishtira **didn’t want to continue** and just said that he would ask his doubts the next morning as the sun was about to set then. (“upaṭi savitāpy astam” – sun is about to set⁵⁹⁰). So before the sunset they wanted to leave for home, heading towards the east. *Why this sense of urgency, not found the previous day?*
- When we look for an answer, we get a hint of it in the very next verse. They left and reached Drishadvati and bathed in the river.
- In **Ganguli**’s translation, “Having offered oblations of water unto their ancestors and silently recited the sacred *mantras* and done other auspicious acts, and having performed the evening prayer with due rites, those scorers of foes entered the city called after the elephant.”
- If this refers to Sandhyopasana, *why is this specifically mentioned only on this day* and not on any other day, particularly on the other days they were returning after listening to Bhishma? Sandhyopasana is done on all days and twice a day.
- We do come across the reference to morning oblations in many contexts. For example the very next morning the Pandavas had done their morning oblations (kṛtapaurvāhṇika kriyāḥ).⁵⁹¹ So this specific verse needs careful analysis.

The verse runs like this: ⁵⁹²

⁵⁸⁹“When Did The Mahabharata War Happen?” Page 136

⁵⁹⁰ Mahabharata: 12-58- 28b

⁵⁹¹ Mahabharata: 12-59-1

⁵⁹² Mahabharata: 12-58-30 <http://www.sacred-texts.com/hin/mbs/mbs12058.htm>

dr̥ṣad vatīm cāpy avagāhya suvratāḥ; **kṛtoda kāryāḥ** kṛtajapya maṅgalāḥ
upāsya saṁdhyāṁ vidhivat paraṁtapaḥ; tataḥ puram te viviśur gajāhvayam

Meaning:

dr̥ṣad vatīm ca = river Drishadvati (feminine, accusative, ī-stem)

apya = being in water (adj. Monier-Williams, Sir M. (1988)), coming from water (Monier-Williams, Sir M. (1988)), connected with water (Monier-Williams, Sir M. (1988))

avagāhya = bathing (SB 11.17.25)

suvratāḥ = strict in observing religious vows (Monier-Williams, Sir M. (1988))

kṛtoda = having performed .

kārya = prescribed duties (SB 10.36.29)

kṛtajapya = kṛta: done, performed (third person singular tense paradigm injunctive class ātmanepada √kr̥)

japaiḥ = japa – muttering prayers (plural instrumental)

maṅgalāḥ: happiness, welfare (masculine nominative, accusative, plural stem: maṅgala)

upāsya = to be revered or honoured or worshipped

saṁdhyāṁ = in the twilight

vidhivat = according to prescribed regulations (SB 2.1.16, SB 10.84.47, SB 11.3.52-53)

paraṁtapa = destroying foes (said of heroes)

tataḥ = in that place, there

puram = pura = city (accusative of pur, Pura)

te= they

viviśur: = to go home to rest (third person, plural tense, paradigm perfect class parasmaipada √viś)

gajāhvayam =Hastināpura (SB 10.68.41)

Overall meaning:

“The destroyers of foes (who happened to be) the strict followers of religious vows bathed in the river Drishadvati in the evening twilight, preformed the prescribed religious vows,

worshiped with japa for welfare and happiness according to the prescribed rules and went back home to Hastinapur.”

In addition to the usual ‘**KRITODA KARYA**’, they did ‘*kṛtajapya maṅgalāḥ upāsya.*’

MANGALA- UPASANA is not part of Sandhyopasana. And this activity getting mentioned specifically on the 2nd day, that happened to be **SHUKLA CATURTHI**, it implies that they did the worship meant to ward off the evil effect of sighting the 4th phase of the moon!

Seeing the 4th phase (Shukla Caturthi moon) is supposed to bring evil to a person. According to an astrological text on religious austerities, the one who happens to see the 4th phase must immediately do a propitiatory worship to ward off the evil. *This practice started after Krishna was blamed for the missing Syamantaka gem, which it was believed to be the result of Krishna having sighted the 4th phase of the moon.* Yudhishtira started this practice which came to be known as Siddhi Vinayaka Vrata in due course.⁵⁹³

This practice seems to have evolved into the **festival of Ganesh Caturthi** in Bhadrapada month – the month in all likelihood being the time Krishna watched the 4th phase and subsequently was blamed for the missing gem. This memory had continued until 150 years ago, is known from an entry in the **Journal of Literature and Science**, by the British writers in describing the Ganesh festival as was celebrated in the then Madras Province. The reference to Krishna having sighted the 4th phase of the moon is reproduced in Figure 48 from the Journal.⁵⁹⁴ . The practice of immersing in water the image of Ganesha worshiped for the event could perhaps be part of the vrat proposed by Yudhishtira. Perhaps initially they conducted the worship only in water on Shukla Caturthi.

man’s head. The Hindoos try their best to avoid seeing the moon that night under a belief that in the event of doing so they will be charged with some false accusation during the year, because Crishna who neglected this rule was falsely accused in his childhood of having stolen a golden gem from Prassana.

Figure 92: Krishna sighted Shukla Caturthi moon

The specific mention of “*maṅgalāḥ upāsya*” seems to be a reference to Lord Ganesha, whose form is supposed to be ‘**MANGALA**’. The planet Mars attained the title Mangala after having seen the **Mangala form of Ganesha** on his wedding with Siddhi (this gave him the name

⁵⁹³ “Jothida Varushadhi Nool” (Tamil) p. 385

⁵⁹⁴ “The Journal of Literature and Science”, October 1833, J.C.Morris, F.R.S., p.17-18

Siddhi Vinayaka), according to Vinayaka Purana. “Mangalambha” is an epithet of Ganesha – referring to starting any work after worshipping Ganesha.

The Caturthi ‘**MAṄGALOPĀSANA**’ done by the returnees including Vyasa in that group seems to *settle down the controversy over whether Ganesha as a scribe for Vyasa was originally present in the text written by Vyasa*. The missing reference to Ganesha as a scribe in the Southern manuscripts of Mahabharata and its appearance only in 37 out of 59 manuscripts resulted in the dropping of the Ganesha reference in the critical edition of Mahabharata.

The Shukla Caturthi performance of the vrat having certain prescribed rules goes to show that some method of worship of Ganesha, the lord of Caturthi tithi, must have been in place at the time of Mahabharata.⁵⁹⁵ There is scope to presume that Vyasa did some form of ‘Maṅgalopāsana’ for the successful completion of the text of Mahabharata that he included it as well in the text as Ganesha, the scribe. By that he assigned the responsibility of completing the text to Lord Ganesha, which is very much in line with the purport of the Caturthi vrat done even today.

The variations in Mahabharata between regions (the southern rescension in this context) **cannot be attributed to interpolations**, for the fact that people of the olden times could not be expected to have meddled with the text that they treated as Veda and remembered in *Upakarma*. On the other hand, in their zeal to preserve the text unadulterated, the Tamil scholars of yore might have dropped the Ganesha reference as a scribe thinking that it was an interpolation. In the Tamil regions Ganesha is basically seen associated with water – drinking, drying and letting off water – and not as a scribe. He is a bestower of knowledge (of Sangam Tamil) and not a scribe.

By cutting short the conversation despite Bhishma’s readiness to talk, and halting at Drishadvati to bath and do the ‘Maṅgalopāsana’, it is conveyed that *the crescent moon of the 4th phase that appeared a little high in the sky the moment darkness set in*, could not have escaped from the vision of the returnees. This made them do the **propitiatory vows** to ward off the evil that was supposed to inflict the viewer. The complete absence of this activity on other days can have no other explanation than this.

⁵⁹⁵ Vinayana was a household deity even as early as Ramayana times. Valmiki says that Vinayaka is fixated in the houses where Ramayana is heard. VR: 6-128-116

3. Day 3 of the conversation with Bhishma (Magha Shukla Pancami).

- Next morning after doing the morning oblations the Pandavas and Yadavas set out to meet Bhishma. ⁵⁹⁶ This was the 54th day before Bhishma Nirvana according to Nilesch Oak.
- Here Nilesch Oak indulges in his habit of bungling with the text to force-fit the days to ‘corroborate’ with his date. Nilesch Oak needs 6 days build up his theory of 56 days before Bhishma Nirvana – of which 50 days were supposed to be the number of days (nights) Yudhishtira spent at Hastinapur after the conversation with Bhishma was over.
- Of the 6 days, only 3 days have been accounted so far now. Nilesch Oak has added one more day here.
- The text says that Yudhishtira returned at the end of the 3rd day to discuss with his brothers. Nilesch Oak reasoned out that this could mean that Yudhishtira went alone and therefore wanted to discuss with his brothers upon return. He made this the 4th day of conversation, which was the 53rd day before Bhishma Nirvana in his scheme. ⁵⁹⁷ This is Nilesch Oak’s imagination for the text does not say anything like this.
- The sequence of events shows that on the 3rd day Nakula too raised a question to Bhishma and got an answer (of relevance to our 13th chapter on Abhijit) which means he was also present on the 3rd day.
- Then it is said that Yudhishtira returned home and discussed with his brothers and Vidura. Yudhishtira raised certain questions on Dharma to all the five (4 Pandavas and Vidura) and sought their explanations to know what they had understood from the conversation so far with Bhishma.
- All of them were satisfied with the answers given by each other. This happened on the 3rd day of meeting Bhishma. Nilesch Oak mistook it to be on the 4th day (53rd day in his scheme).

The same chapter ends with a reference to Yudhishtira leaving to meet Bhishma.

4. Day 4 of the conversation with Bhishma (Magha Shukla Shashthi).

- At the end of the same chapter on Yudhishtira discussing with his brothers, it is said that he left to meet “**saridvarāsutaṃ**” – Saridvarā being the name of River Ganga! (punaś ca papraccha saridvarāsutaṃ) ⁵⁹⁸ This was the 53rd day, but was treated as the 52nd day by Nilesch Oak.
- It was on this day Yudhishtira made a statement, “**śeṣam alpam dinānām**” for the southward sun to turn.

Meaning:

⁵⁹⁶ Mahabharata: 12-59-1 <http://www.sacred-texts.com/hin/mbs/mbs12059.htm>

⁵⁹⁷ “When Did The Mahabharata War Happen?” Page 136

⁵⁹⁸ Mahabharata: 12-161- 48c <https://www.sacred-texts.com/hin/mbs/mbs12161.htm>

śeṣam = remaining, balance (masculine, accusative, stem: śeṣa)

Alpam=a very small quantity (SB 5.9.9-10), brief (SB 6.18.22), very little (SB 7.13.38), very meager (BG 18.22) (masculine, nominative singular stem: alpa)

dinānām = in the days (masculine, genetiv plural, stem: dina)

Overall meaning:

“Very little remains of the days”

- This observation happening on the day of Shashthi, with the northward turn expected within the next tithi, the use of the word, **“alpam” makes perfect sense.**
- The conversation on the 4th day is marked by Yudhishtira’s anxiety to learn everything as Uttarayana was nearing. In the same day we see the description of Bhishma becoming very tired and falling silent. This made Vyasa to close the session, requesting Bhishma to send them off. Bhishma obliged him by telling Yudhishtira to come back when the sun turned northward.
- All of them started back and in this context comes the mention of Dhritarashtra and Gandhari leading the entourage back home.⁵⁹⁹
- This implies that the elders had accompanied the Pandavas on the 4th day as Uttarayana was round the corner. And by the 4th day the Pandavas seemed to have become content with whatever they learned from Bhishma.
- This is **reinforced** by the discussion in the previous night after the return from Kurukshetra, on what each one of them had understood. Nilesch Oak stretched the period of conversation to 6 days from 4 days, so that it became easy for him to adjust the 56 day period with the 50-night reference found in the last day of Bhishma’s life. His calculation became easy by deducting 6 days from 56 days, but did Bhishma live for 50 more days after that?

Did Bhishma live for 50 more nights after the conversation?

The very next chapter following the 4th day conversation with Bhishma is about the last day of Bhishma - the day the sun turned northward. However the 5th verse of this chapter states that “The blessed monarch having passed fifty nights in the capital recollected the time indicated by his grandsire as the hour of his departure from this world.”

uṣitvā śarvarīḥ śrīmān pañcāśan nagarottame (13-153-5)

उषित्वाशर्वरीःश्रीमानपञ्चाशननगरोत्तमे

⁵⁹⁹ Mahabharata: 13-152-12

The number 50 doesn't match with the derivation we made so far. Yudhishtira spent his first night in the capital on the night of coronation. This is reiterated by the details on the palaces allotted to the Pandava brothers coming after the description on the coronation and the shraddha ceremonies. We also deduced Magha Shukla Dwitīya as the day of coronation. The conversation with Bhishma ended on Magha Shukla Shashthi. **FROM DWITĪYA TO SHASHTHI, FIVE NIGHTS OF STAY WERE OVER.** The next day was Shukla Saptamī when the sun turned north (now popularly remembered as Ratha Saptami). The statement by Yudhishtira the previous day about “Sesham alpam,” meaning very less or insignificant –fits with the sequence.

Therefore the word should have been pañcāha (पञ्चाह), not pañcāśa (पञ्चाश) (Figure 49)

Pañcāha = period of 5 days, lasting 5 days (Source: Katāsarit sāgara)

Pañcāha = oblation with 5 Sautyā days (Source: Srauta Sutra, Brāhmana)

<p>‘having 5 horses,’ N. of a prince, VP. Pañcāsu-vandhura, mfn. whose carriage-seats (?) are the 5 vital airs, BhP. Pañcāstikāya, m. N. of wk.; -<i>bālāvabodha</i>, m., -<i>saṃgraha-sūtra</i>, n. N. of wks. Pañcāśya, mfn. 5-faced, 5-headed, MBh.; Hariv.; 5-pointed (as an arrow), MBh.; m. a lion, Kāv.; N. of a partic. strong medicine, Rasar. Pañcāha, m. a period of 5 days, Kathās.; (°<i>hā</i>), mfn. lasting 5 days; m. a Soma oblation with 5 Sutyā days, Br.; ŚrS. Pañcāhika, mfn. containing 5 feast days or festivals, KātyŚr., Sch. Pañcādhmīya, n. (?) a nocturnal rite in which 5 torches &c. are used, Āpast. Pañcāndra, mfn. one who has the 5 Indrāṇis as his deity, Pāṇ. i, 2, 49, Sch.; -<i>kalpa</i>, mfn. like 5 Indras, MW.; °<i>drōṣādhya</i> (?), n. N. of wk. Pañcāndriya, n. the 5 organs of sense (viz. the eye, ear, nose, tongue, and skin) or the 5 organs of action (viz. hands, feet, larynx, and organs of generation and excretion), W.; pl. N. of a tale;</p>	<p>Pañcamīn, mfn. being in the fifth (month or year) of one's age, Pāṇ. v, 2, 130. Pañcamī, f. (of °<i>ma</i>, q. v.) the fifth day of the half month (sc. <i>tithi</i>), ŚrGṛS.; MBh. &c.; the 5th or ablative case (or its terminations), a word in the ablative, Pāṇ. ii, 1, 12 &c.; a termination of the imperative, Kāt.; (in music) a partic. Rāgiṇī or Murchanī; a brick having the length of $\frac{1}{2}$ (of a Puruṣa), Sulb.; = <i>pañcanī</i>, L.; N. of Draupadī (who was the wife of 5; cf. <i>pañcālī</i>), L.; of a river, MBh.; VP. - <i>kalpa</i>, m., -<i>krama-kalpa-latā</i>, f., -<i>varivasyā-rahasya</i>, n., -<i>sādhana</i>, n., -<i>sudhā</i>, m., -<i>stava</i>, m., -<i>stava-rāja</i>, m. N. of wks. Pañcārī, f. = <i>pañcanī</i>, L. Pañcāśa, mf(ī)n. the 50th (ch. of MBh. and R.); + 50 (e. g. <i>īam śatam</i>, 150; cf. Pāṇ. v, 2, 46). Pañcāśaka, mf(ī)ka. 50, Pur.; (īkā), f. a collection or aggregate of 50 (cf. <i>caura-pañcāśikā</i>, <i>śat-p</i>); N. of sev. wks.</p>
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Figure 93: Sanskrit dictionary

<http://sanskritdictionary.com/scans/?col=1&img=mw0578.jpg>

Nilesh Oak had taken “pañcāśa” (50 days) to be part of the ‘remaining 56 days’ told by Krishna.

The problems in accepting extra 50 days (nights):

- The entire duration of the waiting period, be it 56 days or 58 days **cannot go beyond the commencement day of Uttarayana.**
- The Uttarayana of Mahabharata time is **not what Nilesh Oak picks out from his Voyager simulator** mainly because his simulation is based on moving or tropical zodiac.

- On the other hand Uttarayana was deduced on the basis of **tithi- star- month** etc. for the 5 years in the 5 year Yuga calendar.
- It is suspected that there was a **scribal error in writing pañcāha as pañcāśa**.
- This is **the first time so far in this book I am referring to a scribal error** – but I have rectified it with evidence.
- One must know that Nilesh Oak has treated all the important events as errors or conflicting information.

Sequencing the dates of Bhishma Nirvana.

The sequence of the 4 days of conversation after the day of coronation is shown in Figure 94. From the day of coronation, Yudhishtira spent only five nights at Hastinapur. The next day was Shukla Saptami when the sun turned north. The absence of any information between the last day conversation and the Saptami day in addition to the “alpam sesham” verse on the last day of conversation do indicate that the day was nearing.

Bhish-Nir	Tithi	Events	
58	S-8	Uttarayana	
57	S-7- S-8	Ratha Saptami	
56	S-6,S-7	Day-4	
55	S-5,S-6	Day-3	
54	S-4, S-5	Day-2	
53	S-3, S-4	Day-1	
52	S-2, S-3	Coronation	
51	S-1, S-2	Magha (Nija)	
50	Ama-S-1		

Figure 94: The days of conversation

The final sequencing of the dates for Bhishma’s 58 days along with the days of the war is furnished in Figure 95.

Bhish-Nir	Tithi	Star	Events	Bhish-Nir	Tithi	Star	Events
58	S-8	Rohini	Uttarayana	29	S-9		
57	S-7- S-8	Kri -Rohi	Ratha Sapt	28	S-8		
56	S-6,S-7		Day-4	27	S-7		
55	S-5,S-6		Day-3	26	S-6		
54	S-4, S-5		Day-2	25	S-5		
53	S-3, S-4		Day-1	24	S-4		
52	S-2, S-3	U.bhadrapad	Coronation	23	S-3		
51	S-1, S-2		Magha (Nāg)	22	S-1-S-2	Magha Adhika	
50	Ama-S-1			21	Amawa-S1	Shra + Dhani	19 Gada Yuddha
49	K-14			20	Amawas	Utt+Shra	18 War ended
48	K-13			19	K-14	Pur+Utt	17
47	K-12			18	K-13	Moo+Pur	16
46	K-11			17	K-12	Jye+Moo	15
45	K-10			16	K-11	Anu +Jye	14 Late Moon-rise
44	K-9			15	K-10	Vis+Anu	13
43	K-8			14	K-9	Swa + Vis	12
42	K-7			13	K-8	Chi +Swa	11
41	K-6			12	K-7	Has+ Chi	10 Fall of Bhishma
40	K-5			11	K-6	U.P+ Has	9
39	K-3, K-4			10	K-5	P.P+U.P	8
38	K-2			9	K-4	Mag +P.P	7
37	K-1			8	K-3	Asl +Mag	6
36	PAURNAMI			7	K-2	Push + Asle	5
35	S-14			6	K-1	Pu+Push	4
34	S-13			5	Paurnami	Aru + Pu	3 Lunar eclipse
33	S-12			4	S-13+14	Mri +Aru	2
31	S-11			3	S-12+13	Roh +Mri	1 War started
30	S-10			2	S-11	Kri +Roh	Gitopadesa
				1	S-10	Pushya	Bharani+Kr Bharani Homa

Figure 95: Bhishma's 58 days.

- There is perfect alignment of the dates of war. Two eclipses occurred within the 19 days of the war of which the 19th day solar eclipse was an extended tithi.
- This would cause a kshaya tithi in the ensuing month, which I showed in the waning phase. The **Adhika masa** must have coincided with the sun's transit in Capricorn.
- The Adhika masa (unexpected in Magha but caused by anomalous speed of the moon after the comet-hit) must have started soon after the sun entered Capricorn.
- That was the **true position of the sun** at winter solstice in Mahabharata period. Based on this it can be said that Bhishma arrived at the date of Uttarayana, by merely deducting 4 tithis from the normal date for the 2nd year in the Yuga, and not by the actual movement of the sun as was the case in all the 4 years except the 1st year.
- There must have been *some confusion on deciding the Uttarayana* day at that time (the 2nd year) due to loss of tithis.
- It appears that **Bhishma merely compensated for the loss of 4 tithis** while **Krishna appeared to have deducted just 2 tithis**. Finally Bhishma's authority prevailed.
- This probability is needed to be highlighted here for, the intermediary Adhika masa would push Uttarayana to a date when the *Sun would be in Aquarius*.
- In the normal course, the sun would have moved **within Capricorn**. The simulated version in Figure 96 shows the sun in Aquarius, with the lunar month mentioned as Phalguni.

- As per the actual sequence then, it should be Nija Magha and with New Year (Vishvavasu) starting from Uttarayana.

Body	Longitude	Nakshatra	Pada								
Lagna	7 Vi 16' 27.15"	UPha	4								
Sun - AK	26 Aq 04' 01.37"	PBha	2								
Moon - AmK	20 Ta 07' 37.70"	Rohi	4								
Mars - BK	19 Aq 21' 31.68"	Sata	4								
Mercury (R) - MK	10 Aq 53' 06.32"	Sata	2								
Jupiter - PK	4 Ta 58' 52.31"	Krit	3								
Venus - PiK	9 Cp 56' 14.14"	USha	4								
Saturn - GK	3 Aq 20' 12.41"	Dhan	4								
Rahu - DK	28 Cn 24' 47.81"	Asre	4								
Ketu	28 Cp 24' 47.81"	Dhan	2								
Date: December 16, -3136				Vedic Weekday: Tuesday (Ma)							
Time: 6:30:00 pm				Nakshatra: Rohini (Mo)							
Time Zone: 5:30:00 (East of GMT)				(24.05% left)							
Place: 77 E 12' 00", 28 N 36' 00"				Sunrise: 6:36:29 am							
New Delhi, India				Sunset: 5:38:03 pm							
Vishvavasu Nija Magha				Janma Ghatis: 29.7299							
Lunar Yr-Mo: Krodhi - Phalguna				Ayanamsa: 0-30-41.39							
Tithi: Sukla Ashtami (Ra) [Tvarita]											
(99.50% left)											

Figure 96: The day of Bhishma nirvana (the day of Uttarayana)

Figure 96 shows Ashtami starting late in the evening, after sunset, but the description in the text shows that Bhishma left sometime in the afternoon. The discrepancy in the time of the tithi by about **12 hours** was already established in the context of the lunar eclipse of the 3rd day. This anomaly is due to the variance in time caused the comet-hit that was gradually getting rectified. That is reflected again at the time of Bhishma leaving the earth. The Ashtami tithi must have started by the afternoon of that day.

It must also recalled here of what we wrote earlier for **RATHA SAPTAMI VRAT**. The Vrat is performed on the day having ‘**Tithi-Dvayam**’ – of a tithi ending after sunrise and the next one starting during the day. Shukla Saptami must be running at sunrise, but must have started the previous day. This condition is found fulfilled for the date simulated in Figure 96. The sunrise tithi (Saptami) was treated as the time of northward turn of the sun. Sometime afterwards Ashtami had started. *Bhishma didn't want to wait for the next sunrise to touch Ashtami.* From the description in Mahabharata it is known that he left his mortal coils on the same day having **SAPTAMI AT SUNRISE BUT AFTER ASHTAMI HAD BEGUN.** By that evening this Itihasa's tryst with Kurukshetra got ended!

Calculation of the 58 nights of Bhishma:

Counting started from the night before Bharani Yajna (Rana Yajna) when Pushya Shukla Dasami was running.

Pushya Shukla Dasami to Full moon = 6 tithis

Pushya waning phase = 15 tithis

Magha Adhika masa = 30 tithis

Nija Magha Shukla paksha Saptamī = 7 tithis

Total = 58 tithis

Bhishma had meant the counting in tithis.

Calculation of the 56 days of Krishna:

The calculation is same as above but started after Gitopadesa when Pushya Shukla Dwadasi began. Shukla Dwadasi was running on the night of Gitopadesa and was present at day break on the 1st day of the war.

Mahabharata Time-line.

Tabulation of the important events of Mahabharata derived in this chapter is given in Figure 53.

Event	Year name	Lunar month-tithi	Star	Day	Gregorian date
Start of the exile	Khara	Ashadha - Krishna Dasami	Rohini	Sunday	May 7, 3149 BCE
End of the exile	Krodhi	Ashadha - Krishna Dasami	Krittik	Sunday	May 11, 3136 BCE
Krishna's peace mission	Krodhi	Kartika - Shukla Dwadasi	Revati	Monday	August 25, 3136 BCE
Balarama yatra started	Krodhi	Kartika - Krishna Shashthi	Pushya	Tuesday	Sep 2, 3136 BCE
Comet-hit	Krodhi	Kartika - Krishna Shashthi	Pushya	Tuesday	Sep 2, 3136 BCE
1st 13 tithi phase ended	Krodhi	Kartika - Amawasya	Vishakha	Wednes	Sep 10, 3136 BCE
2nd 13 tithi phase ended	Krodhi	Margashira - Purnami	Krittika	Wednes	Sep 24, 3136 BCE
Pandava army started	Krodhi	Margashira - Krishna Tritiya	Pushya	Monday	Sep 29, 3136 BCE
Both armies assembled	Krodhi	Margashira - Krishna Shashthi	Magha	Thursday	Oct 2, 3136 BCE
Bharani Yajna	Krodhi	Pushya - Shukla Dasami	Bharani	Tuesday	Oct 21, 3136 BCE
Gitopadesa	Krodhi	Pushya - Shukla Ekadasi	Krittika	Wednes	Oct 22, 3136 BCE
War commenced	Krodhi	Pushya - Shukla Dwadasi	Rohini	Thursday	Oct 23, 3136 BCE
Lunar eclipse	Krodhi	Pushya - Purnami	Punarvasu	Saturday	Oct 25, 3136 BCE
Bhishma's fall	Krodhi	Pushya - Krishna Shashthi	Hasta	Saturday	Nov 1, 3136 BCE
14th day of war	Krodhi	Pushya - Krishna Ekadasi	Anuradha	Wednes	3 AM, Nov 6, 3136 BCE
18th day of war	Krodhi	Pushya - Krishna Caturdasi	Uttarashadh	Sunday	Nov 9, 3136 BCE
Duryodhana fled	Krodhi	Pushya - Krishna Caturdasi	Uttarashadh	Sunday	Nov 9, 3136 BCE
Balarama returned	Krodhi	Pushya - Amawasya	Shravana	Monday	Nov 10, 3136 BCE
Solar eclipse	Krodhi	Pushya - Amawasya	Shravana	Monday	Nov 10, 3136 BCE
Gada Yuddha	Krodhi	Pushya - Amawasya	Shravana	Monday	Nov 10, 3136 BCE
Duryodhana's fall	Krodhi	Pushya - Amawasya	Shravana	Monday	Nov 10, 3136 BCE
Yudhishthira coronation	Krodhi	Nija Magha - Shukla Dwitiya	Uttara Bhadr	Thursday	Dec 11, 3136 BCE
Bhishma's end -Uttaraya	Vishvvasu	Nija Magha - Shukla Ashtami	Rohini	Tuesday	Dec 16, 3136 BCE
Kali Yuga commenced	Pramathi	Caitra - Amawasya	Aswini	Thursday	Jan 22, 3101 BCE

Figure 97: Mahabharata Time-line

This tabulation establishes that **the modern calendar system is not relevant** for deciphering and establishing Mahabharata calendar of 5-year Yuga, given in traditional Panchanga terms. It is always mandatory to derive the dates as per Mahabharata calendar and then find out the corresponding dates in the Gregorian calendar or in the simulator. While checking with the simulator, there comes the additional problem of sticking to the **exact degree of precession of the sun** on the date of the event. I used Surya Siddhanta Ayanamsa that happens to be close to the precession of Mahabharata times. Let me remind the reader that it was **ZERO AT THE COMMENCEMENT OF KALI YUGA!** Let me also remind the reader that Nilesch Nilkanth Oak was not even aware that precession is not permanent.

He was absolutely ignorant of the need to adjust the precession degree with the one prevailing in Mahabharata times. The use of the tropical zodiac of his simulator completely puts at naught all the derivations he had given.

The Tabulation corroborates the number of Tirtha yatra days of Balarama in terms of stars. Bhishma's waiting period matches with Tithi. Even the duration of war was in terms of stars!

The Gregorian date is just for reference and in no way reflective of Mahabharata dates of yatra, duration of war etc.

Defects in Nilesh Oak's Bhishma Nirvana research.

Nilesh Oak's theory of Bhishma Nirvana does not concur with major references of Mahabharata. To name them,

- Could not corroborate 58 days mentioned by Bhishma himself (primary evidence)
- Could not solve the conflicting nature of Krishna's version of 56 days.
- Could not establish the start and end date / day of the waiting period of Bhishma.
- Could not establish the number of days of conversation with Bhishma on the basis of Mahabharata inputs.
- Could not distinguish between the Sandhyopasana and Mangalopasana.
- Adjusting the dates to align with the Uttarayana (winter solstice) date of his simulator designed for tropical zodiac.

He attested the 3rd highest relevance and falsifiability to Bhishma Nirvana and claimed that this "*falsified all previous proposed time-lines for the Mahabharata War.*"⁶⁰⁰ In reality he falsified Mahabharata references of Vyasa!!

The 'quality' of his research was such that he only adjusted the dates to match with winter solstice date of his simulator. He has no qualms in writing,

"The day after winter solstice (31st January 5560 B.C.) is the day when the sun truly turns north and thus my preference for the 6th December as the first day of Yudhishtir visiting Bhishma. I assert that Bhishma was lying on the bed of arrows, based on above timeline, for 98, and not 58 nights." 601

The reader can now understand why he stretched the conversation (with Bhishma) period to 6 days, why he accepted Krishna's version of 56 'more' days without any discussion and why he invented 27 days as the duration spent by the Pandavas on the bank of river Ganga. He had to fit-in everything with the ultimate date (winter solstice) shown by his simulator. Force-fitting the astronomy references with his simulator date is what 'research' means for this archaeo-astronomer.

THE YEAR WAS PICKED OUT FROM A NON-EXISTENT EPOCH within which he described the astronomy references of Mahabharata, not more than 20 or so – and all of them manipulated

⁶⁰⁰"When Did The Mahabharata War Happen?" Page 196

⁶⁰¹"When Did The Mahabharata War Happen?" Page 138

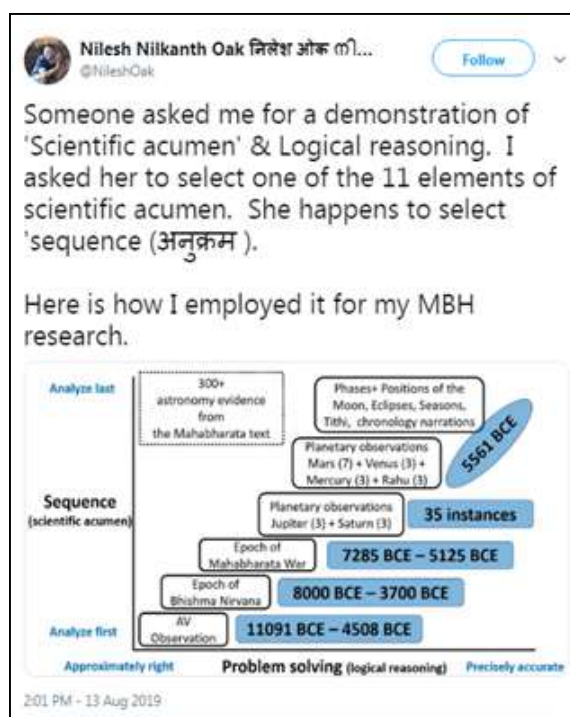
in weird ways, but he would claim in the public domain that he has ‘corroborated’ 300+ astronomy references. Let the reader be informed that this list includes ‘corroborating’ analogies too in his simulator!!

A list of all the manipulations done by him is discussed in the **Appendix I**. The reader cannot find a single explanation or interpretation for any of the astronomy references of Mahabharata in his book. Whatever one finds are simulator based or ‘explained away rather than explain Mahabharata observations’ – to use his own words about other researches.⁶⁰²

Of Sequence (Anukrama) and scientific acumen of Nilesch Oak.

Before ending this chapter I want to remind the reader that all the astronomy observations by Vyasa in his conversation with Dhritarashtra have been proved so far by way of decipherment of the verse and in astrology simulator. Another reminder pertains to the decipherment of sequence of events of Mahabharata right from the time of end of exile of the Pandavas. I had taken up all the Panchanga features of the Mahabharata events and deduced the dates first in traditional Mahabharata calendar and then cross-checked with astrology simulation designed to the nearest ayanamsa of Mahabharata times. It perfectly matched with traditional version.

Contrast this with Nilesch Nilkanth Oak’s ‘sequence’ of events. He posted the following in his tweet on 13th August 2019 as demonstrative of his ‘scientific acumen.’



⁶⁰²Ibid. Introduction: page 3

His sequence starts from the **non-existent and discredited ‘AV observation’**. Rest of the events are located within this. In the face of complete demolition of the AV observation (last chapter), his entire sequence stands broken. The reader must also be reminded that **the 300+ astronomy evidences that he claims to have proven in the tweet are non-existent**. His book contains 217 references to astronomy terms of which many are analogies.

Next in order (in reverse) in the above tweet he speaks about having corroborated the phases + positions of the moon, eclipses and seasons. They are found to be phoney claims, with most of them exposed for hollowness in the earlier chapters. He refers to corroborating Tithis too in the above tweet which is a blatant lie. *The only tithi he had spoken often is the Amawasya tithi which is however wrongly interpreted for the first day of the war*. The only other time he talks about tithi is in the chapter on Mahabharata Astronomy where he has given a brief on Tithi along with other traditional terms. His claim of corroboration of 35 instances of planetary observations was mostly exposed until now and the rest to be exposed in the **Appendix I**.

The final word does belong to the traditional version that has been well corroborated in the pages above. Nilesh Nilkanth Oak's work has done nothing other than tarnishing the Iconic status of Arundhati besides undermining the continuing thread of tradition in this country.

Chapter 13

THE 'FALL' OF ABHIJIT AND THE RISE OF VEDIC CULTURE

In his book published in 2011 Nilesh Oak ultimately concludes that the narration of the Fall of Abhijit was a record-keeping of sorts.⁶⁰³ He also says that the episode is a metaphor wherein “Skandha is identified with the axis of the Earth”⁶⁰⁴ without justifying or quoting any reference to show that Skanda indeed signifies the axis of the earth. He describes the Fall of Abhijit as a movement of the star from the ecliptic to the Polar region, which could anyway be celebrity moment for a star given the Puranic narrations of Dhruva striving become a Pole star! However Nilesh Oak does not think so and calls this as a slipping movement of Abhijit.⁶⁰⁵

Nilesh Oak's explanation in his book.

In his book he even faults with the Vedic wisdom for choosing Abhijit as a nakshatra! He writes,

*“It is important to note that the choice of Abhijit as a nakshatra is not an ideal choice. Even when Abhijit is closest to the ecliptic, its position is still far away from the ecliptic (+40°). As Abhijit moved towards the celestial North Pole, astronomers would have faced difficulties in employing Abhijit as a functional nakshatra, for tracking positions of the Moon and /or the Sun, a necessary step in reckoning of time.”*⁶⁰⁶

So the ancient rishis whose concept of time keeping continues to be in vogue till date in our country, had erred in their judgement of keeping Abhijit as a ‘functional’ nakshatra! Nilesh Oak has found out the error and is educating us on how Abhijit lost out the race to Dhanishtha! In his blog dated March 25, 2016⁶⁰⁷ *he compares the Right Ascension of the two stars to prove that Dhanishtha went ahead of Abhijit to become the first star* (to substantiate the Mahabharata version that Brahma ordained Dhanishtha to be the first star) even while Abhijit was slipping down.

⁶⁰³Ibid. Page 52

⁶⁰⁴“When Did The Mahabharata War Happen?” Page 42

⁶⁰⁵Ibid. Page 47

⁶⁰⁶Ibid. Page 51

⁶⁰⁷“Tale of two nakshatras – Abhijit & Heather” <https://nileshoak.wordpress.com/2016/03/25/tale-of-two-nakshatras-abhijit-heather/>

Interpreting the above quoted four verses, Oak has written his blog dated July 21, 2015,⁶⁰⁸

*“(1) Dhanistha (DEVI) began competing with Abhijit for seniority and thus went to **summer solstice**. (emphasis mine)*

(2) Abhijit fell from the sky (went away from its position high up in the sky towards horizon, close to NCP).

Indra asked Skandha to consult Brahma in order to do required adjustment to the calendar.

(3) At that time (as a result) Brahma assigned first rank to nakshatra Dhanistha (for it being at the point of summer solstice). Rohini used to be in the first position prior to this.

(4) When Indra said this, Krittika went to the 3rd part of heaven. This nakshatra (Krittika) with Agni as its devata and of the shape of a cart shines.”

This explanation shows that he believes that the ‘Fall’ actually meant Abhijit moving closer to the NCP thereby losing out to Dhanishtha which moved closer to the “summer solstice” thereby becoming the first star. He even compared the relative movement of the two stars to a sprint in his blog in 2016⁶⁰⁹



Within a few months of giving the above figure, Niles Oak dropped Dhanishtha from the race and concentrated only on Abhijit stating that Abhijit was dropped from the list of nakshatras after seen to have gone closer to the NCP⁶¹⁰

Ultimately Niles Oak maintains that the ‘fall’ of Abhijit was metaphorical of Abhijit moving closer to the NCP from the ecliptic. The “fall” happened around 14,500 BCE.⁶¹¹

⁶⁰⁸“Fall of Abhijit – 4 श्लोक & 3 Interpretations (Part 4 of 4)” <https://nileshoak.wordpress.com/2015/07/21/fall-of-abhijit-4-%e0%a4%b6%e0%a5%8d%e0%a4%b2%e0%a5%8b%e0%a4%95-3-interpretations-part-4-of-4/>

⁶⁰⁹“Tale of two Nakshatras – Abhijit & Heather” <https://nileshoak.wordpress.com/2016/03/25/tale-of-two-nakshatras-abhijit-heather/>

⁶¹⁰“On the identification of Brahmarashi with nakshatra Abhijit” <https://nileshoak.wordpress.com/2016/10/07/on-the-identification-of-brahmarashi-with-nakshatra-abhijit/>

⁶¹¹<https://twitter.com/NileshOak/status/1176183921781944320?s=03>

1. Fall of Abhijit (नक्षत्र गगनाच्च्युतम्)

- Ancient Indian narratives are full of metaphors in preserving celestial, terrestrial and historical events of the past. 'Fall of Abhijit' is one such astronomy metaphor, from the Mahabharata text.
- Some researchers/astronomers have tried to explain this metaphor with varying level of success (S B Dikshit, P V Vartak). On the other hand, individuals who consider Mahabharata as merely a story written in primitive time not only think of these metaphors as meaningless chatter but employ it as evidence to make a claim that ancient Indian narratives are of no value in understanding ancient Indian civilization.
- One may wonder if it is possible to decode 'fall of Abhijit' metaphor in the light of developments of modern astronomy which in turn shed light on antiquity of Indian civilization.
- (Nilesh Oak has shown) The answer is decisively yes! The metaphor of 'fall of Abhijit' and all its elements have been decoded using knowledge of modern astronomy & Indian astronomy, and it leads to a time of ~14500 BCE.

Problems with Nilesh Oak's theory of Fall of Abhijit.

The basic problem with Nilesh Oak's approach is that, for anything and everything he mindlessly uses the astronomy simulator. I want to remind the readers the folly of sticking to the shifting zodiac of the western software. In the above version of Nilesh Oak, he has placed Dhanishtha at summer solstice (Dakshinayana). Have we ever come across a reference in our texts that Dakshinayana started from Dhanishtha?

Look at the other absurdities in Nilesh Oak's book from his so-called experiments.⁶¹² Can anyone show evidence for the following from our texts?

According to him Uttarayana started in Rohini in 9500 BCE.

Again Rohini was at the beginning of Uttarayana in 16,000 BCE.

Rohini was at the beginning of Dakshinayana in 22,500 BCE.

Dhanishtha was at vernal equinox (Vishu) in 20,000 BCE.

From the long range of Vedic past that he is often showing, CAN HE PICK OUT A SINGLE REFERENCE THAT VALIDATES ANY ONE OF THE ABOVE FOUR POINTS HE HAD MADE IN HIS BOOK?

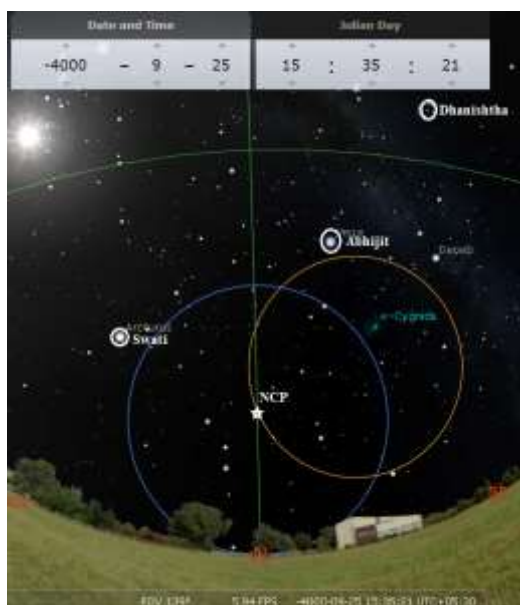
He is not at all aware of the absurdity caused by his reliance on the tropical zodiac of the astronomy software. One can also understand that he has no elementary knowledge of Vedic astronomy either, from his justification for why corrections such as the removal of the star Abhijit on account of the "Fall" are needed. He writes,

"All modern calendars require additional corrections, in addition to the protocol of periodic corrections. Assigning leap year every 4 years plus additional rule of not taking century year

⁶¹²"When Did The Mahabharata War Happen" pages 48 & 49

as a leap year unless it is evenly divisible by 400 or adding of extra lunar month (Adhika masa) to every 2.5 lunar years are examples of periodic corrections.”⁶¹³

- He says that all modern calendars (Gregorian) need periodic correction of adding Adhika Masa or extra lunar month every 2.5 years. It seems he is up with a novel idea on calendar reform. It would be immensely helpful if someone seeks clarification from him on how to “add extra lunar month” in the modern calendar.
- Only Uttarayana or the star in which the sun starts the northern sojourn is given primacy and hence the status as the first star in the 5-Year Yuga calendar of the Mahabharata times. How then Dhanishtha at Dakshinayana can be taken as the first star?
- Does Nilesh Oak know that in addition to Abhijit there are other stars identified as hovering around high northern latitudes? Let me help him with the version of Siddhanta Shiromani that says, *“The stars Abhijit, Brahma-Hridaya, Swati, Shravana, Dhanishtha and Uttara-Bhadrapada never disappear owing to the sun’s light on account of the greatness of their north latitudes in the northern hemisphere.”*⁶¹⁴
- It is not just Abhijit, the above mentioned other stars also get closer to the NCP at different times, but they have never been branded as having fallen. For instance the star Swati was much lower in the northern horizon than Abhijit or Dhanishtha around 4000 BCE in the tropical zodiac. The following picture taken from Stellarium software vouchsafes this.

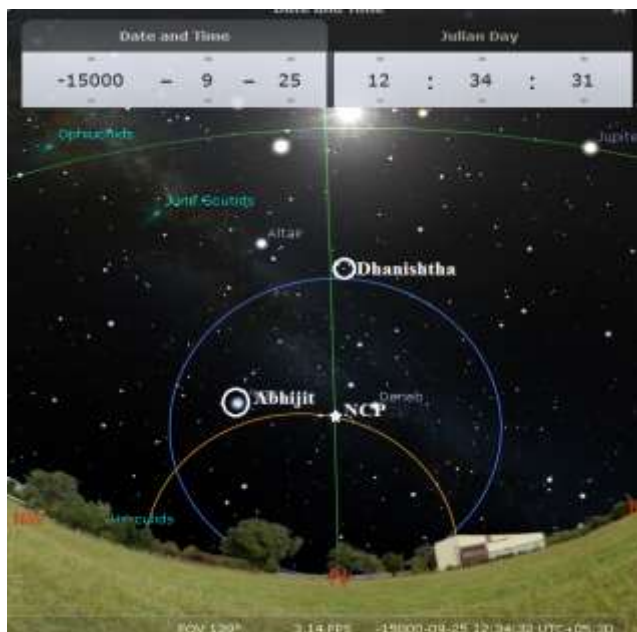


4000 BCE at Hastinapur.

⁶¹³Ibid. Page 46

⁶¹⁴Siddhanta Shiromani: Ch 9-18

In 15,000 BCE close to Nilesch Oak's year of Fall of Abhijit (14,500 BCE), Dhanishtha was in circumpolarity and not moving across the sky! (below)



To use Mr Oak's continuously precessional tropical zodiac, it shows that in the year 15,000 BCE both Abhijit and Dhanishtha were circumambulating the NCP for, when seen from Hastinapur. Dhanishtha did not rise in the eastern sky and didn't set in the western sky. In other words it was not closer to the ecliptic. Until 16,000 BCE, Dhanishtha was slipping down towards the NCP. After 15,000 BCE it started moving up again towards the ecliptic. So it would be apt to refer to the lowest ever movement of Dhanishtha towards the northern horizon as the 'Fall' of Dhanishtha. *Unfortunately our rishis didn't refer to any fall for Dhanishtha or any other star in the farther northern latitudes.* (Readers must remember that these positions are possible in western astronomy software only. As per Vedic thought these stars were in high northern latitudes.)

- These figures convey that something else has been indicated by the "Fall" of Abhijit. The figures also convey that Markandeya's narration has *nothing to do with a comparison between Abhijit and Dhanishtha*. Dhanishtha was always the upper limit of Uttarayana. That has been indicated by the line "*dhanishthādis tadā kālo brahmaṇā parinirmitaḥ.*" From Dhanishtha, Uttarayana may slip down by 54 degrees till 3 degrees of Sagittarius but had never gone forward of Dhanishtha- something I established in the 5th chapter. The status of being the first was given to the star in which Uttarayana started. In the 5-Year Yuga system the year began in **Uttarayana** only.
- The above two figures separated by 11,000 years do show the impossibility of Dakshinayana starting at Dhanishtha ever in the past. Dhanishtha as a star close to North Pole and shuttling

between the mid-heavens and closer to the NCP can never appear at the point of Dakshinayana. This renders absurd the utility of using the shifting zodiac of the astronomy software.

- **THE TEXT NOWHERE SAYS THAT THERE IS A “FALL”, BUT SOMEHOW THAT WORD HAS COME INTO USAGE TO REFER TO THE SHIFT IN THE POSITION OF ABHIJIT.** Nilesh Oak repeats the same mistake of not defining the meaning or the idea behind the verse or the concept of ‘Fall’, like he skipped defining ‘Prishṭha’. He is once again found shooting in the dark to see if anything resembles the ‘Fall’. In his blog of March 25, 2016,⁶¹⁵ Nilesh Oak has given graphs for relative values of Right ascension, speed and declination for Abhijit and Dhanishtha and interprets each of them as indicative of Dhanishtha coming first. Dhanishtha coming in the lead means Fall of Abhijit according to Nilesh Nilkanth Oak!
- But *the text doesn’t put Abhijit and Dhanishtha on a race*; it compares Abhijit with Rohini only. The text identifies Abhijit as the younger sister of Rohini who being jealous of Rohini retired to the forest. The problem is Nilesh Oak could not connect Rohini with Abhijit in any way through his Voyager Simulation Nyaya and so he has taken up the one (Dhanishtha) that he was able to locate in his simulator by virtue of it being a neighbourhood star of Abhijit!

If only he had come out of his obsession with his simulator and believes for a second that decipherment must first take place textually, conceptually and by internal references, before looking at the simulator for everything, he might have come up with a reasonable explanation for the Fall of Abhijit, and more importantly why Abhijit was she and not he at that time. He thinks that any mention of a celestial body can and will be deciphered by means of his astronomy simulator and that is what ‘scientific’ acumen means.

Contextual analysis of the Fall of Abhijit.

Let me take up the analysis of what really was conveyed by **Markandeya** in that narration. The narration runs into many chapters and sounds allegorical of the events around Skanda’s birth and growth. **Two types of natural calamities** are described in that narration, one caused by heavy downpour and lightning strikes on mountains or hills accompanied with a tectonic burst and another indicative of a terrible comet or asteroid hit that caused havoc in most of the Northern hemisphere. In between these events occurs the recognition of the “Fall of Abhijit.” Let me briefly go through them to decipher what was meant by the ‘Fall’ of Abhijit.

⁶¹⁵“Tale of two Nakshatras – Abhijit & Heather” <https://nileshoak.wordpress.com/2016/03/25/tale-of-two-nakshatras-abhijit-heather/>

Birth of Vishakha

The birth of Skanda is well known from Valmiki Ramayana but this Mahabharata version is truly a revelation on many things including the birth of *Vishakha*. Skanda's birth is described by Markandeya as having happened from the Adbhuta Fire begotten to the wives of the Brahma-rishis who were none other than the wives of six rishis of the Saptarishis.⁶¹⁶

As per **Vayu Purana**, **ADBHUTA** was the son of Savana, the fire used for cooking flesh.⁶¹⁷ It was not a sacred fire, nor used for sacred purposes. He (adbhuta) had an intense desire for the wives of the Saptarishis. (Here we are clueless about who the wives were as we know only of Arundhati, the wife of Vasishtha in the binary system. Anyway let us move further with the story to know the import). Unable to gratify his desire, he repaired to the forest with the certain objective of destroying himself. (This is indicative of a time when fire was less in use or the 'heat' of the fire or 'heat' of the sun was very less. The time was perhaps before the onset of Holocene)

There was a woman called '**SVAHA**' who was the daughter of Daksha. (Being the daughter Daksha Prajapati implies that she (it) has an inevitable existence in Nature). She wanted to marry Adbhuta who was referred to as Hutasana or Agni in the text. But Agni was not interested in her and he only longed to get the wives of the Saptarishis.

Seeing this, Svaha devised a plan to lure Agni. Each day she impersonated one of the wives of the Saptarishis and cohabited Agni. Over six days she impersonated the wives of six rishis and collected the semen in a golden lake. *She could not impersonate Arundhati due to the ascetic merit of Arundhati, says Markandeya.*⁶¹⁸ This is allegorical of the nature of Arundhati that she was not found moving away from her position of following Vasishtha!

From the semen of the Agni collected by Svaha, in the guise of wives of six rishis, Skanda was born with six faces! Seated on top of a hill he broke the Krauncha hill with his weapons and started becoming powerful. On coming to know of the complicity of their spouses in the birth of Skanda, the six rishis abandoned their wives. Meanwhile Skanda grew up in prowess and this made the celestials feel threatened. They sought refuge in Indra who went on a war with Skanda. A fierce battle ensued in which Indra threw his thunder-bolt that pierced Skanda on his right side. This caused another being coming out of Skanda who attained the name

⁶¹⁶Mahabharata: 3-213 <https://www.sacred-texts.com/hin/mbs/mbs03213.htm>

⁶¹⁷ Vayu Purana: Part 1- 27: verse 38

⁶¹⁸Mahabharata: 3-215-5 <https://www.sacred-texts.com/hin/mbs/mbs03215.htm>

‘Vishakha’⁶¹⁹ to mean ‘born out of piercing’. On seeing the indomitable strength of Skanda, Indra sought truce with him.

The description of the war by Indra in which he used the thunderbolt conveys the event of a lightning strike that probably split a hill or a mountain or caused damage to it. It could also mean lava burst from a fissure that occurred at the time of lightening as the narration says that Skanda diffused the thunder showers of Indra by blowing out fire. This is metaphorical of a simultaneous lava-burst causing a fissure on the ground when there was a heavy rainfall. But rainfall stopped once after the fire burst out of the fissure, and this was expressed as Indra seeking truce with Skanda.

The splitting of the ground came to be regarded as ‘Vishakha’ and the text describes this as Vishakha born out of Skanda. Many people died and many were born after this event and those born after this event identified themselves as the Children of Vishakha!

Markandeya says, “A number of male children came into being when Skanda was struck with the thunder-bolt, those terrific creatures that steal spirit away from little children, whether born, or in the womb and a number of female children too of great strength were born to him. Those children adopted Visakha as their father.”⁶²⁰

Abhijit, wives of six rishis and marriage of Svaha with Agni.

On seeing the prowess of Skanda, Indra got Devasena, the daughter of Daksha, married to him. Devasena has other names that we are familiar with!

evaṃ skandasya mahiṣīm devasenāṃ vidur budhāḥ

ṣaṣṭhīm yāṃ brāhmaṇāḥ prāhur lakṣmīm āsāṃ sukhapradām

sinīvālīm kuhūṃ caiva sadvṛttim aparājitām⁶²¹

(Ganguli: “She who is called Shashthi, Lakshmi, Asa, Sukhaprada, Sinivali, Kuhu, Sadvritti, and Aparajita, is known among men as Devasena, the wife of Skanda”)

Then comes the narration that the abandoned wives of the six rishis approached Skanda and wanted him to erase the bad name they earned. Skanda accepted them as his mothers. After this the four verses on Abhijit written in the beginning of this chapter appears as told by Indra.

1. Abhijit, jealous of her elder sister Rohini retired to the forest to do tapas.

⁶¹⁹Mahabharata: 3-216-13 <https://www.sacred-texts.com/hin/mbs/mbs03216.htm>

⁶²⁰Mahabharata: 3-217- 1& 2

⁶²¹Mahabharata: 3-218-47 <https://www.sacred-texts.com/hin/mbs/mbs03218.htm>

2. Indra could not find a substitute for Abhijit.
 3. Brahma had assigned the foremost place for Dhansihtha and also for Rohini and their number was full.
 4. On the advice of Indra, Skanda assigns a place for Krittika in the heavens.
- This was followed by Svaha approaching Skanda expressing her desire to marry Agni.

[svāhā]

dakṣasyāhaṃ priyā kanyā svāhā nāma mahābhujā
 bālyāt prabhṛti nityaṃ ca jātakāmā hutāśane
 na ca mām kāminīm putrasamyag jānāti pāvakaḥ
 icchāmi śāśvataṃ vāsaṃ vastuṃ putra sahāgninā

Translation by Ganguli:

“Svaha replied, 'O mighty being, I am the favourite daughter of Daksha, by name Svaha; and from my youthful days I have been in love with Hutasaṇa (the Fire-god); but that god, my son, does not understand my feelings. I desire to live for ever with him (as his wife).”

Skanda replied: “From this day, lady, all the oblations that men of virtuous character, who swerve not from the path of virtue, will offer to their gods or ancestors with incantation of purifying hymns by Brahmanas, shall always be offered (through Agni) coupled with the name of Svaha, and thus, excellent lady, wilt thou always live associated with Agni, the god of fire.”

[skanda]

havyaṃ kavyaṃ ca yat kiṃ cid dvijā mantrapuraskṛtaṃ
 hoṣyanty agnau sadā devī svāhety uktvā samudyatam
 adya prabhṛti dāsyanti suvṛttāḥ satpathe sthitāḥ
 evam agnis tvayā sārddhaṃ sadā vatsyati śobhane⁶²²

Catastrophe from the sky.

Continuing further with the sequence of the narrative, Skanda also known as Kartikeya was anointed as the **Commander-in-chief of the celestials** with none to equal him. He was sent with all paraphernalia and was seen off by Sankara.

After Skanda was seen off by Sankara and Uma, there occurred a terrible shower of weapons on the celestials and towards where Sankara and other celestials stood. This account, though sounding like mythological warfare, contains description that smacks of a comet or asteroid

⁶²²Mahabharata: 3-220- 3 to 6

breaking into pieces by showering numerous fiery canons (Shatagni), hillocks (parvata) and rocks in all directions and particularly in the direction where Sankara stood.

Skanda sprang into action immediately by hitting them back again and again with his weapon called Sakti that returned back to him after hitting. At last Skanda successfully exterminated the enemies (Danavas) and this earned him a great name as one in the image of Rudra. With this the narration ends with a eulogy on Skanda.

Decoding Markandeya's narration.

The above narration of Skanda's birth contains a number of allegorical events. The use of specific names for Skanda hints at the location where the birth and events had taken place.

The events of the catastrophe have a parallel with the Tamil version of Skanda's life.

Vishakha's sons had peopled India and started an important lineage of India. Most important of all, the marriage of Svaha with Agni facilitated by none other than Skanda makes a decisive statement on when, where and by whom the Vedic tradition was initiated. When we know where all these events had happened we get a pleasant surprise of what was meant by Abhijit retiring to the forest. Let me elaborate them.

Marriage of Svaha with Agni conducted by Skanda signals the start of Vedic Homa.

Foremost feature decoded from the narration is the marriage of Svaha with Agni. Svaha is the term chanted while making the oblations in the Homa fire. Without Svaha, no oblations are made. Therefore marriage of Svaha with Agni can only refer to the first ever time the practice of offering oblations into fire was started. This is nothing but the birth of Homa culture that forms the basis of the Vedic culture.

That Skanda had conducted this marriage goes to show that Skanda was the first one to have started the Vedic Homa and thereby the Vedic culture!

Skanda had been explicit in saying that by this marriage of Svaha and Agni, people can offer oblations (Havya and Kavya) to Gods and ancestors.

The terms '**havyam kavyam**' in the earlier quoted verse starting as, "havyam kavyam ca yat kim..." refer to first Agni or Aupasana done by the householder. Vayu Purana in the chapter on genealogy of Agni refers to Havya-vahana and Kavya-vahana as referring to Āvāhaniya and Gārhapatya respectively.⁶²³ Vayu Purana says that Agni was the mental son of Brahma

⁶²³Vayu Purana: Ch 28- verses 1 to 5

and Svaha bore to him three sons, Pāvaka, Pavamāna and Śuci or Śaura (solar fire). Pavamāna's son is Kavya-vahana, the fire of Pitrus. Śuci's son is Havya-vahana, the fire of Devas. Pāvaka's son is Sahasrakṣa, the fire of Asuras.

That Skanda had initiated the Āvāhaniya and Gārhapatya homa was immortalised into a story of Skanda conducting the marriage of Svaha with Agni. These two fires are the primary fires from which all the other homas are done. Of the two fires the Gārhapatya, derived from the word Gruhapati, the lord of the house or the householder is the first agni that a son receives from his father and passes on to his son. This Agni is to be kept alive at home throughout one's life time. Even if the husband is away, the wife can do this homa. This appears in consonance with a time that Agni was protected at home as the only source of light and fire. This Homa was first initiated by none other than Skanda is what is revealed in this verse.

These two Agni Homas constitute what is called 'AUPASANA'. From this Aupasana Agni, Pāka yajnas, attributed to Manu are done. The Pāka yajnas also are about household yajnas done with portioning cooked rice. Thus we find the development of the Vedic Homa started by and starting from Skanda, and further expanded by Manu with more developments in course of time.

The story of marriage of Svaha with Agni appeared after the marriage of Skanda with Devasena, leading to the deduction that Skanda started doing these homas (to Devas and Pitrus) after his marriage with Devasena. So it is apt to say that Skanda- Devasena was the first couple to protect or create Gārhapatya-Agni and Āvāhaniya for making offerings.

Till date the etymology of Aupasana and the description of the same is found missing in any Vedic literature. (However without Aupasana, no other homa can be done) The causes are obvious when we come to know that Skanda had introduced it at a troubled times of fear from Agni, perhaps seeking protection from Agni and when Manu and Vedic sages had not yet appeared. The term 'Aupasana' seems to be derived from 'Aum-upasana' – as we know from the Tamil tradition of Skanda having taught his father, Lord Shiva, the Praṇava which is nothing but 'Aum'.

- The decipherment of the story of marriage of Svaha with Agni solemnised by Skanda puts at naught the Aryan debates and about who started the Vedic culture or who brought the Vedic culture.

- This story also puts at rest the unresolved question of how and why the Tamils have had a long past of Vedic culture ingrained within the society as known from the ancient Sangam literature.

That Skanda was the initiator of the Homāgni is revealed further in the description of Skanda in this Mahabharata narrative. Skanda had six faces of which the middle one was that of a goat says, Markandeya.

ṣaṣṭhaṃ chāgamayaṃ vaktraṃ skandasyaiveti viddhi tat

ṣaṣ ṣiro 'bhyantaraṃ rājan nityaṃ mātṛgaṇārcitam⁶²⁴

(**Ganguli:** “Know that the sixth face of Skanda was like that of a goat. That face, O king, is situated in the middle of the six, and is regarded constantly by the mother”.)

The same idea is found in the Sangam text that describes each of the six faces and what they look at.⁶²⁵ In this form as *Shanmukha* (six faced) the goat face will be looking at the Vedic Homa says the text.

The Goat (Chāga) is unique to Homāgni, as the Agni Deva is mounted on a goat according to the iconographic rules found in *Mayamatam*.⁶²⁶ It says that Agni Deva,

“is mounted on a ram and is near the fire pit and he must wear the ascetic’s belt. Svaha is to his right, adorned with jewelled ear-rings. Agni, whose adornments are russet and who is favourable towards all sacrifices, is pure.”

This iconographic description with goat as the mount and Svaha as the consort of Agni taking oblations must clear any doubts arising from other legends of Agni with names of consorts being different in such legends.

When Agni is associated with Svaha it refers only to Vedic Homa.

Skanda as facilitator for the marriage of the two is a clear statement that Skanda was the initiator of Vedic culture.

⁶²⁴Mahabharata: 3-217-12

⁶²⁵Tiru Murugarru Padai,

⁶²⁶Mayamatam: Ch 36- 142, 143 (Translation by Bruno Dagens)

Vedic Homa: Initiated by Skanda and carried over by Vivasvan and Manu.

With Mahabharata stating in no uncertain terms, through the words of Markandeya that Skanda formalised the wedding of Svaha with Agni and declaring the starting of Homa thereon, we are able to identify the chronological evolution of Vedic culture from Skanda.

The significant hint is the birth of Vishakha from Skanda at the time of terrible lightening which was diffused by Skanda by spewing fire and those born after that event calling themselves as the children of Vishakha! The foremost among them was ‘*Vivasvān*’- whose son *Vaivasvata* was the progenitor of the current *Manvantara*!

“*Vivasvān, the son of Aditi, the first among the planets, the sun-god, was born in the constellation Viśākhā in the Cākṣuṣa Manvantara*”, says Brahmanda Purana.⁶²⁷

Skanda existed towards the end of the 6th Manvantara known as Cākṣuṣa, and shortly after him the current Manvantara of Vaivasvata had started

- Like Yugas known at Divya and Dharma scale, Manvantaras also seem to follow a larger and smaller time. At smaller time the classification is known from the heroes and events around them. Skanda, known as one who lived in flesh and blood, existed at the end of Cākṣuṣa manvantara. We will know the time period of this when we discuss about the date of Skanda shortly.
- The birth of Vivasvan in Vishakha could only mean that Vaivasvata Manu and other people of his ilk were born after the terrible calamity of the “splitting”, with fire bellowing out while there were terrible lightning strikes. Their birth happened at or after the time of Skanda.
- The progeny that followed, hailed Vishakha as their father.
- The Ikshvakus coming in the lineage of Vaivasvata Manu also identified Vishakha as the star of their dynasty!
- Giving evidence for this let me quote Lakshmana’s words to Rama while they were moving towards the sea shore carried by Angada and Hanuman (carrying Rama). Lakshmana was referring to the stars seen at that time and mentions Vishakha as the supreme star of the Ikshvakus!⁶²⁸

vimale ca prakāśete viśākhē nirupadrave

nakṣatraṃ param asmākam ikṣvākūṇāṃ mahātmanām

⁶²⁷Brahmanda Purana: 24-129

⁶²⁸Valmiki Ramayana: 6-4 -45 <https://www.sacred-texts.com/hin/rys/rys6004.htm>

(**Meaning:** “*Visakha stars are shining clearly without any evil influence. This supreme constellation is of our Ikshvakus, the high-souled*”) ⁶²⁹

Again during Rama’s direct fight against Ravana, the star Vishakha is mentioned as the one adorned by the kings of Kosala, the country of Rama and Ikshvakus.

kosalānām ca nakṣatraṃ vyaktam indrāgnidaivatam
ākramyāṅgārakas tasthau viśākhām api cāmbare ⁶³⁰

(**Meaning:** “*The planet Mars stood assailing in the sky, the constellation Vishakha, presided over by the gods Indra and Agni (the god of fire), which is adorned by the kings of Kosala.*”) ⁶³¹

Reading through Valmiki Ramayana, one can even say that the Ikshvakus held Skanda as their supreme deity. At the time of Rama leaving to the forest, his mother Kausalya invokes Skanda’s name among other deities to protect him. Notable feature in this is that all except Skanda are Vedic or (perhaps) non-human deities. She says,

smṛtir dhṛtiś ca dharmaś ca pāntu tvām putra sarvataḥ
skandaś ca bhagavān devaḥ somaś ca sabṛhaspatiḥ ⁶³²

(**Meaning:** “*May Veda, the Smṛiti texts taken as one body, the resolution and the piety protect you, my son! May lord Skanda and the moon god along with the sage Brihaspati, the well-known seven sages as well as Sage Narada guard you on all sides.*”) ⁶³³

Similarly Manu invokes only Skanda’s name along with other Vedic deities in the mantra of consecration of Indradvaja ⁶³⁴ signalling that in those times of Manu’s emergence, Skanda was a deity of worship.

Manu’s name is also associated with the primary homas called ‘*Pāka yajna*’. ⁶³⁵ This is done from Aupasana fire. The strange feature is that there is hardly any mention of this fire in

⁶²⁹Valmiki Ramayana: 6-4-51 http://www.valmikiramayan.net/utf8/yuddha/sarga4/yuddha_4_frame.htm

⁶³⁰Valmiki Ramayana: 6-90-30 <https://www.sacred-texts.com/hin/rys/rys6090.htm>

⁶³¹Valmiki Ramayana: 6-102-36 http://www.valmikiramayan.net/utf8/yuddha/sarga102/yuddha_102_frame.htm

⁶³²Valmiki Ramayana: 2-22-4 <https://www.sacred-texts.com/hin/rys/rys2022.htm>

⁶³³Valmiki Ramayana: 2-25-11 http://www.valmikiramayan.net/utf8/ayodhya/sarga25/ayodhya_5F25_frame.htm

⁶³⁴Bṛhat Samhita: 43- 52to 55

⁶³⁵Taittiriya Samhita says that Manu himself was the seer of the *Pāka yajnas* “What are Vedic Yajnas?” <http://jayasreesaranathan.blogspot.com/2012/10/what-are-vedic-yajnas-guest-post-by-r.html>

Taittiriya Samhita says Vedic scholar **Ramanathan**⁶³⁶ lending credence to its primary existence, initiated by Skanda, but before Vedic verses were composed.

All the other primary homas of the householder, going by the name *Pāka yajna* were associated with Manu's name. Manu seemed to have carried over the Vedic Homa (Aupasana) from Skanda with newer additions.

IT WAS ONLY ALONG WITH OR AFTER MANU, THE RIG VEDIC COMPOSITIONS HAD EVOLVED.

There again a strange feature is noticed by the presence of retroflex sound of Tamil (ḷ) substituting 'ḷa' sound of the Rig Veda.⁶³⁷ This has been pointed out by Kanchi Mahaswami⁶³⁸ who also brings to our notice the traditional view that the entire Rig Vedic compilation was '*Agni Upasana*' – the worship of Agni - by starting and ending the compilation with the worship of Agni.⁶³⁹ He further says that Rig Veda is an anthology of stotras in Mantra form. Yajur is the practical application of them in worship. Saman calms down the mind.

Thus the three Vedas had evolved as a network to conduct the Vedic yajnas. All these trace their origin to Skanda's *Havya- Kavya (Aupasana) Agni*, at a time Abhijit retired to the forest and was substituted by Krittika. In stellar terms that was also the time the star Vishakha had come into existence, but in the absence of a reference to its identify as a new star included in the zodiac, it is understood that the star was already part of the 27 star zodiac but was re-named after the event of the 'birth' of Vishakha by Indra's Vajrayudha!

Having established the Vedic origins to Skanda the next task is to ascertain the date of Skanda. The date is enumerated in two ways which match with each other.

Date of Skanda from Tamil literature.

The Tamil literary past had spanned across three Ages of Tamil Sangam of which the earliest was initiated by none other than Skanda, who was known as Ugra Kumara of Pandyan lineage. He was born to Tadathaka, later glorified as Mīnakshi, married to Chokkanatha, identified as an incarnation of Lord Shiva. Skanda with his father constituted an Assembly for the purpose of developing Tamil in three ways, viz., prose, poetry and drama.

In all the Assemblies conducted even after Skanda had exited the world, his name was invoked and a learned person was chosen to represent Skanda to adjudicate the material

⁶³⁶http://jayasreesaranathan.blogspot.com/2013/05/is-vedic-astrology-derived-from-greek_6.html

⁶³⁷<http://www.kamakoti.org/tamil/Kurall87.htm>

⁶³⁸Chandrashekarendra Saraswati, also known as Paramacharya (1894-1994)

⁶³⁹Rig Veda Mantra Kosam, Part 1: Introduction: xvi (Tamil)

presented. This had gone on for long even after losing their capital city to natural calamities and re-settling in newer places. The last such Assembly was conducted 2000 years ago by a Pandyan King by name *Ugra Peruvaṭuti*. From inscriptional evidences we are able to establish without doubt that the last Assembly was conducted sometime around the start of the Common Era.⁶⁴⁰

The commentary presented at the last Sangam Assembly by poet **Nakkeerar** to a Grammar work called '*Irayanar Agapporul*' contains the duration of each of the Sangam periods along with the number of participant-poets and some of their names.

One such name just refers to the King of Dwaraka who attended an Assembly of the 2nd Sangam. This could be a reference to Krishna because he was the first and last king of Dwaraka founded by him. After his exit, it was lost to the seas.

In corroboration of this information of Nakkeerar, there exists a verse in Mahabharata spoken by Krishna that the king of the *Bhoja*-s, belonging to his clan, had conquered the *Pandya*-s by his learning.⁶⁴¹ This appears like a reference to establishing his mastery over some form of knowledge, which in the case of *Pandya*-s could only refer to successfully publishing a composition in Tamil in the Assembly of Sangam that requires one and all in the Assembly to endorse it unanimously.

Tamil source: Krishna attended the 2nd Sangam Assembly.

Krishna in Mahabharata: Bhoja of his clan established his knowledge in Pandyan Assembly.

The correlation between the two different references establishes that Krishna attended the session of the Sangam Assembly in which a member of his clan published his literary work.⁶⁴²

⁶⁴⁰In verse 367 of Puranāuru, the poetess Auvaiyar praises the Pandyan King Ugra Peruvaṭuti who was seen along with the other kings, Chola and Chera. Perhaps that was the occasion of the Sangam Assembly. The Cholan king Peru narkilli who did Rajasooya yajna was spotted along with Ugra Peruvaṭuti as per the poem. These two kings appear in Tiruvalangadu Copper plate inscriptions and Sinnamanur Copper plate inscriptions respectively. Auvaiyar, the contemporary of Ugra Peruvaṭuti, also happened to be a contemporary of Adiyaman Neduman Anji. This is known from the numerous verses she penned on him, now available in Tamil Sangam corpus. Neduman Anji's time period has been established by epigraphers from Jambai inscriptions, to be around 200 BCE. Therefore the date of the last Sangam assembly was around 200 BCE. However, I have taken up the the beginning of the Common Era, as the base year.

⁶⁴¹*caturyuḥ sa mahārāja bhoja indra sakho balī*

vidyā balād yo vyajayat pāṇḍya krathaka kaiśikān (Mahabharat 2.13.20)

⁶⁴² The composition must have been only in Tamil. The Sangam founded with the goal to promote grammatical Tamil had never entertained a composition from any other language.

With this cross-reference from Mahabharata corroborating the long history of Sangam Assembly let me divulge into the duration of each Sangam Age narrated by Nakkeerar. According to him the first Sangam lasted for 4440 years, the second for 3700 years and the third for 1850 years (till the time he presented his work). Now adding up these years until the start of the Common Era we arrive at the following years.

3rd Sangam started around 1850 BCE.

2nd Sangam started around 5550 BCE.

1st Sangam started around 9990 BCE.

THIS PUTS THE TIME OF SKANDA AROUND 9990 BCE OR 10,000 BCE OCCURRING AROUND THE BEGINNING OF HOLOCENE.

To substantiate that Sanskrit was known to Skanda at that time (to facilitate the conduction of Vedic Homa), there is textual reference that Tamil existed side by side with Sanskrit.⁶⁴³ This idea is a very old one – something found in old texts and also coming by tradition. There is even a time period for this, mentioned in **Tirumandiram** authored by Tirumular, a Siddha. The verse says,

“There was a time when rainy season and summer season ceased to exist. There was snow everywhere that made the lakes to shrink. At that time Lord Shiva taught Sanskrit and Tamil to his consort.”⁶⁴⁴

The time corresponds to the **ICE AGE OR PRE-HOLOCENE** *when two languages were formed by a people owing allegiance to Shiva or Shakti or both.* The very purpose of the Tamil Sangam being promotion of grammatical Tamil, it goes without saying that the language was newly formed and was sought to be popularised among the masses. Simultaneously the ‘well-perfected’ Sanskrit was used for Vedic Homa. Thus we find the birth two languages - both formed with efforts and were not naturally existing and perhaps drawn from a pre-existing proto language. The name of just only one person is associated with both the languages at the time of their formation. That person was Skanda, who initiated the Tamil Assembly for the promotion of Tamil and Vedic Homa in which Sanskrit found an everlasting utility.

Skanda was the only person associated with the birth of Tamil Sangam and the birth of Vedic Homa

⁶⁴³Tiruvilaiyadal Puranam: Tirunattu cirappu - 56

⁶⁴⁴Tirumandiram – verse 65

His time as per Tamil literary evidence was around 10,000 BCE (12,000 years before present). His life events as given in Tamil texts⁶⁴⁵ more or less match with the description of Markandeya. The comparison with the Tamil texts is necessary to establish the authenticity of the events involving Skanda.

- The first ever event in Skanda's life as per Mahabharata was breaking the Krauncha mountain. The same is found in Tamil literature too. That perhaps marks the time people invented means to break the mountains slopes for stone works.
- Skanda was described as seated on a hill top in the narration by Markandeya. That is also the same in Tamil tradition, and temples of Skanda are found on hill tops.
- The next event was the fight with Indra in which Indra attacked with Vajrayudha 'piercing' Skanda, leading to the birth of Vishakha. The parallel in Tamil texts speaks about the first sea flood that was controlled by Skanda by throwing the spear he got from his mother, Shakti.
- This event might sound as a myth, but a similar kind of event is reported in Rama's life too when he was asked to direct his Brahmastra at a place so that the sea at the place he was standing could recede, giving way for him to cross the sea.
- From the available scientific knowledge we can say that a tectonic disturbance at a place on the sea- floor can cause the waves move in a different direction. Both Skanda and Rama had directed their weapons at a region in the sea in such a way that water in their places receded and sea floods moved in a different direction.
- The name 'Vishakha' is not associated with this legend in Tamil.
- The 'Fall' of Abhijit appearing after this incident in Mahabharata is not found in Tamil texts. The marriage of Svaha and Agni mentioned in Mahabharata has a different kind of presence in Tamil texts. There is complete chapter on Skanda having taught the Vedas to sages. The foremost teaching was giving the PRANAVA MANTRA (AUM) to his own father Shiva, says **Tiruvilaiyadal Puranam.**⁶⁴⁶ Skanda teaching Praṇava to Shiva is found in all legends of Skanda in Tamil. The temple of Skanda at SWAMIMALAI is hailed as the place where he taught the *Praṇava*. Praṇava being the initial utterance at any Vedic chant, it appears now - after realising the role of Skanda in the marriage of Svaha and Agni – that Skanda as the initiator of Vedic Homa had been remembered by the Tamils by the story of teaching Praṇava to Shiva himself. In reality it was the occasion of Skanda conceiving the concept of 'AUPASANA' (AUM- Upasana) and conducting the Homa every day after his marriage with Devasena.

⁶⁴⁵Tiruvilaiyadal Puranam, Madurai Kānchi

⁶⁴⁶Tiruvilaiyadal Puranam, 1156 (authored by Paranjothi Munivar)

With clear leads that we have got from both Mahabharata and Tamil texts on Skanda's role in starting the Vedic Homa, our next task is to identify the location of Skanda from where he observed the 'Fall' of Abhijit.

Skanda's location at Tiruchendur.

To unlock this mystery, let me look for the hints in Markandeya's narration. He often refers to Skanda as Guha and the followers of Skanda as Guhyakas. There is also the narration of marriage of Skanda with Devasena! This information can be found as an expanded story in the chronicles of Skanda in Tamilnadu. The story of Skanda's marriage with Devasena was preceded by the war with SURAPADMA. The location of Skanda after the war was Tiruchendur. For this reason Tiruchendur is known as *Srijayantipuram*. Even the name Tiruchendur is a corrupted form of Sanskrit word Sindhu, a name Adi Sankara has used to denote this place near the ocean, in one of his verses.⁶⁴⁷ Sindhu+ur had become Chendur and the prefix 'Tiru' was added for auspiciousness.

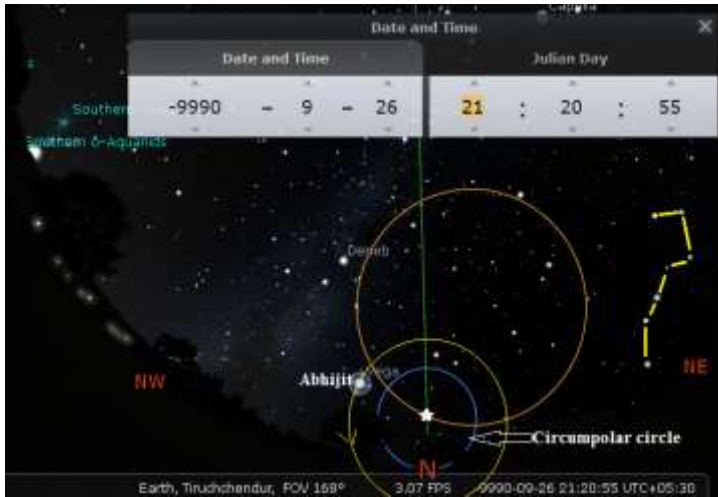
It was originally **a cave justifying the name of Skanda as a cave dweller**. One can see remnants of the cave inside the temple even today and fragments of a cave a little away. Sometime in the past the cave was removed and the present structure had come up.⁶⁴⁸ That the entire region was once a huge cave can be made out from the sudden depression in that part of the town where the temple complex stands. The cave has been completely removed to build the temple. The same rocky material of the cave is found on the floor of the seashore in front of the temple. The main shrine of Shanmukha has cave-roof, proving without doubt that this part of Tiruchendur was once a cave. Temple legends say that Skanda worshiped Shiva at the main shrine where he as Shanmukha is worshiped now.

Fall of Abhijit noticed from Tiruchendur.

The talk of Abhijit comes after the marriage of Skanda with Devasena that took place after winning the asuras. When we checked the sky-view from Tiruchendur for the time deduced from Tamil literature, i.e. 9990 BCE in the tropical zodiac of the astronomy software it does show Abhijit disappearing near the horizon (following figure).

⁶⁴⁷ Subrahmanya Bhujangam: verse 4

⁶⁴⁸ <http://tiruchendur.org/devasthanam.htm>



(Yellow circle: Abhijit's orbit. Orange circle: Polar precession circle)

If we were to believe Nilesh Oak's version, Arundhati must have been leading Vasishtha in this year, but the version of Markandeya clearly states that Arundhati was never seen moving away from her position until then.

For this year Abhijit could not be said to have 'fallen'. However the movement of Abhijit was more close to the description of retiring to the forest around 10,800 BCE. At that time it was exactly on the circumference of the circumpolar circle and as such it appeared to disappear behind the forests at the northern horizon of the observer when it moved in the bottom part of the circle.

However the Vedic concept of the to and fro movement of the equinoxes within 54 degree range (27 +27) rejects the above depiction of the astronomy software. As per the Vedic concept the vernal equinox must have coincided with zero degree Aries at the time of Skanda.

The last time the Vernal equinox coincided with zero degree Aries was at the start of Kali yuga (3101 BCE). The previous time was 7200 years ago (in forward direction) that occurred around 10,301 BCE – the time close to Skanda's time with a margin of just 300 years.

(Figure below)

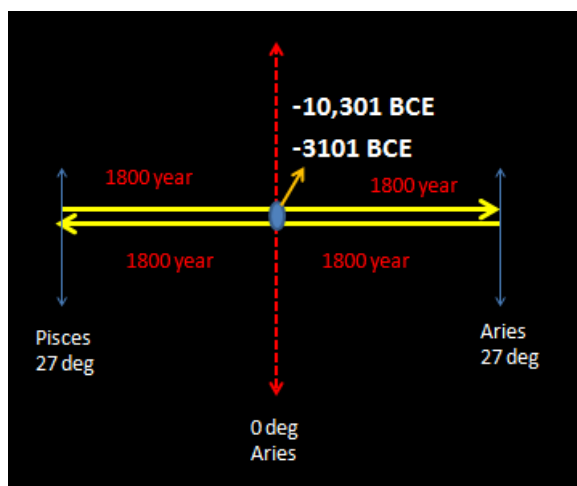


Figure 98 To and Fro movement of equinox.

At the point of vernal equinox at zero degree Aries, the world witnessed catastrophe by fire in the form of comet hit before Mahabharata war. At the same point in the previous cycle Adbhuta fire was experienced. It is perhaps in lieu of this, the pole star at that point was named Agni. And the birth of ‘Vishakha’ happening at that time caused by Indra and resulting in Agni deciphered in earlier passages, it is evident that the concept of “*Indrāgni*” as the deity of Vishakha had its genesis at this time only.

It must also be recalled here that the northern pole star at the time of vernal equinox at zero degree Aries was identified as twin names or one after the other as Agni and Indra by Vayu Purana⁶⁴⁹ Brahmanda Purana⁶⁵⁰ and Taittiriya Aranyaka.⁶⁵¹ With only 3 northern pole stars recognised by Vayu Purana, (named Kasyapa, Agni and Dhruva with Dhruva identifiable with Polaris)⁶⁵² it is deduced that Indra, owing to close proximity to Agni (name of the pole star) near the NCP for zero degree vernal equinox date, was merged with Agni, and referred to as *Indrāgni*.

Early evidence of rice in Tiruchendur supports genesis of Vedic Homa around that region.

Rice is an important grain used as oblations in the Aupasana fire – the primary fire that was initiated by Skanda in our analysis. This requires cultivation of rice or availability of wild rice in the region around Tiruchendur. Research shows that wild rice occurred naturally since 20,000 years BP in the region of Tiruchendur, of all the places in India!

⁶⁴⁹Vayu Purana: Ch 52- 96

⁶⁵⁰Brahmanda Purana: 23- 107

⁶⁵¹Taittiriya Aranyaka: II-19-1

⁶⁵²Vayu Purana: Ch 52- 98

The following map shows evidence of growth of refugial wild rice in regions around Tiruchendur and the adjacent land-locked region between India and Lanka since the last Glacial Maxima around 20,000 years BP. Parts of Eastern India too was growing rice since then as an extension of South East Asian influence. In contrast the rest of India particularly the Saraswati region did not support growing of rice - the grain that is inevitable for Vedic Homa until 9000 years BP!

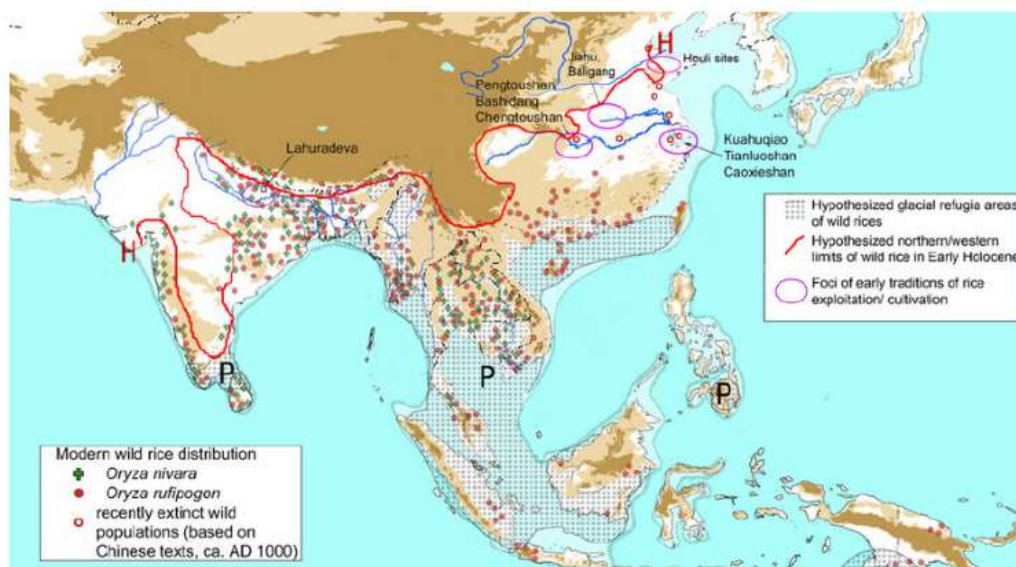
However the growth of rice is proven in the region around Dwaraka, the mouth of Saraswati – ever since 9000 years BP (H in the map). West coast of Peninsular India also had grown rice.

Having known that Skanda had established the Vedic Homa and Manu had come into existence only after Skanda, we can trace the path of migration from south east India (Tiruchendur) to Dwaraka through coastal line. Vishakha's children have moved through this route and entered mainland India through Narmada valley and Saraswati River when a flash flood pushed them inwards into Saraswati facilitating them to reach the Himalayan ranges. But then the earlier presence was in Sarayu, showing the initial presence in trans- Sarayu region where Manu's descendants, the Ikshvakus thrived. The rice-route establishes the earlier civilization to be Sarayu civilization much before Saraswati- Sindhu civilization evolved, perhaps from a migration from Sarayu and Eastern India.^{653, 654} **Rice-genetics** completely rules out Aryan migration from Europe which was freezing with cold when Skanda was actively evolving Vedic Homa!

⁶⁵³Varma, Radha Kant (2008). "Beginnings of Agriculture in the Vindhya-Ganga Region" *History of Agriculture in India (up to c.1200 A.D)*. Concept Publishing Company. New Delhi. pp 31-46

⁶⁵⁴Petrie, C., Bates, J., Higham, T., & Singh, R. (2016). "Feeding Ancient Cities in South Asia: Dating the Adoption of Rice, Millet and Tropical Pulses in the Indus Civilisation." *Antiquity*.90 (394).pp1489-1504.
<https://doi.org/10.15184/aqy.2016.210>

Fig. 1 Map of Last Glacial (20,000 BP) refugial wild rice zones (P) versus Early Holocene (9,000 BP) expansion (H) of wild rice in comparison to recent populations indicated by crosses and circles (after



Rice distribution map since 20,000 BP (P) and 9000 BP (H) Source: Fuller et al. [2010a](#)⁶⁵⁵

In this map, P located in South East India is where Tiruchendur exists. Srilanka was land-locked as per this map even as early as 9000 BP (7th – 8th millennium BCE). This rejects straightaway Nilesh Oak's date of Ramayana around 14,000 BP. At that time Rama and his Vanara army could have just walked across the Palk Strait and not laboured to build the Setu bridge!

Abhijit was the younger sister of Rohini.

The narration of the Mahabharata text shows that Kritika was not in the list of stars at that time. The list had 27 stars with Abhijit one among them. Abhijit sounds like a male name but it was referred to as the sister of Rohini. This confusion on gender can be resolved by looking at the concept of the 27 star-system. The 27 stars were daughters of Daksha Prajapati married to moon. As such Abhijit was treated as a female.

But then how did Abhijit become the sister of Rohini? A basic knowledge in astrology would help answer this question. The 27 stars are categorised into 3 groups of nine each. The three stars in a row are said to belong to the same category and become the ruler of a planet.

Asvini	P.Phalguni	P.ashadha
Bharani	U.Phalguni	U.ashadha
Rohini	Hasta	Abhijit
Mrigashirsha	Chitra	Shravana
Arudra	Svati	Dhanishtha
Punarvasu	Vishakha	Satabhishak
Pushya	Anuradha	P.bhadrapada
Aslesha	Jyeshtha	U.bhadrapada
Magha	Moola	Revati

One can see that Rohini, Hasta and Abhijit are of the same group and Moon was the planet ruled by them. Of the three, Rohini enjoys primacy as a star ruled by Prajapati.

Dhanishtha and Rohini were foremost

The next feature in the verse refers to the primacy enjoyed by Dhanishtha and Rohini.

The verse is repeated here for continuity in reading.

dhanishṭhādis tadā kālo brahmaṇā parinirmitaḥ

rohiṇyādyo 'bhavat pūrvam evaṃ saṃkhyā samābhavat

Nilesh Oak interprets this verse as “At that time (as a result) Brahma assigned first rank to nakshatra Dhanishtha (for it being at the point of summer solstice). Rohini used to be in the first position prior to this”

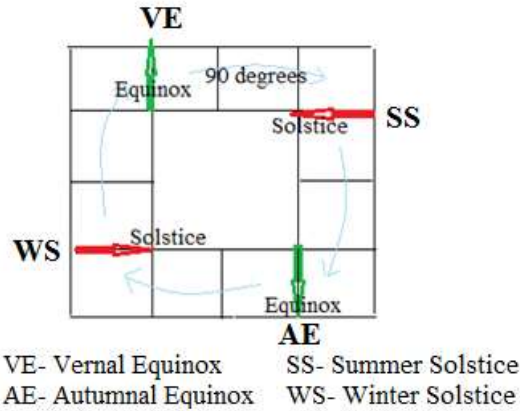
The verse does not say that Dhanishtha was assigned the first rank at that time (of noticing the Fall of Abhijit). Nor does it say that Dhanishtha was at summer solstice. Ganguli’s translation is more exact. It runs as follows:

“Dhanishtha and other asterisms were created by Brahma, and Rohini used to serve the purpose of one such; and consequently their number was full.”

The verse conveys that both Dhanishtha and Rohini had a place of primacy in the olden system.⁶⁵⁶ To understand what this means, we must recall the 90° (right angle) distance between the solstice and the equinox in the zodiacal design which can be easily understood from the following astrological chart. The zodiac is divided into 12 parts of 30° each. At every 90° the equinox and solstice alternates.

⁶⁵⁶ Brahmanda Purana (23-140) says that Dhanishtha is first among the stars, referring to Uttarayana’s maximum limit starting from Dhanishtha.

The following figure shows the Mean location of the solstices and the equinoxes when the vernal equinox is at zero degree Aries. As explained in the 4th chapter, the oscillation of the equinoxes goes to the maximum extent of 27 degrees on both sides of the Mean position of the equinoxes and the solstices.



Suppose the winter solstice (Uttarayana) starts in Dhanishta, the vernal equinox (Vishu) will occur at Kritika (by the rule of 27 degrees) in the current zodiac. But in the olden zodiac Kritika was not present and Rohini was there in its place. In that case if Uttarayana started in Dhanishtha, Vernal equinox occurred at Rohini.

To decipher the location of Abhijit and Rohini in the zodiac of Skanda's time before Abhijit was dropped and replaced by Kritika, let me first test the traditional view prevailing now that Abhijit started at 6°40' of Capricorn. Let me reproduce the zodiac by placing Abhijit at 6°40'. I have noted down the degrees in terms in 'pada' for easy understanding and counting.

1 star = 4 padas.

1 pada = 3°20' (1 minute =60 seconds)

3 pada = 10°

9 pada = 30° = 1 sign of the zodiac.

27 padas (9 x 3) = 90° = distance between a solstice and the equinox.

There is another equation pertaining to the distance of 27°, on either side of Mean VE, AE, SS and WS

27 degrees = 8 pada (=26.40 degree)

In the following illustration I have placed Abhijit in Capricorn at the 3rd pada (after 6°40'), i.e. after the last 3rd and 4th padas of Uttrashadha. The requirement as per Mahabharata is the

distance between Dhanishtha and Rohini must be 90° to make them foremost in the solstice and equinox respectively. This gap is equal to 27 pada. We have to match only that Pada of Rohini that lies at 28th pada from a pada of Dhanishtha.

P.Bhadra 1,2,3,4 U.Bhadra 1,2,3,4 Revati 1	Revati 2,3,4 Asvini 1,2,3,4 Bharani 1,2	Bharani 3,4 Rohini 1,2,3,4 Mriga 1,2,3	Mrig 4 Arudra 1,2,3,4 Punar 1,2,3,4
Shravana 4 Dhani 1,2,3,4 Shata 1,2,3,4	Zodiac with Abhijit starting from 06° 40' Capricorn. Krittika has no place in this zodiac. Only 27 stars.		Pushya 1,2,3,4 Ashlesha 1,2,3,4 Magha 1
U Shada 3,4 Abhijit 1,2,3,4 Shravan 1,2,3 Capricorn			Magha 2,3,4 P.Phal 1,2,3,4 U.Phal 1,2
Moola 2,3,4 P.Shada 1,2,3,4 U.Shada 1,2	Anuradha 1,2,3,4 Jyeshtha 1,2,3,4 Moola 1	Chitra 4 Swati 1,2,3,4 Vishakha 1,2,3,4 Radha	U.Phal 3,4 Hasta 1,2,3,4 Chitra 1,2,3

Deductions from this illustration :

If Uttarayana started at the 2nd pada of Dhanishtha, Vernal equinox would start at the 1st pada of Rohini.

3rd pada of Dhanishtha - 2nd pada of Rohini

4th pada of Dhanishtha - 3rd pada of Rohini.

Inference:

- Never in the past had the equinox gone beyond Rohini.
- When vernal equinox had occurred at Rohini, Krittika was not part of the zodiac.
- To put it differently wherever the texts say that vernal equinox occurred at Rohini, it goes without saying that Krittika was not counted at that time. If Krittika was there, the vernal equinox could have occurred only in Krittika – due to the right angled distance between Uttarayana and vernal equinox.
- The confusion over the equinox at Mrigashirsha (*Agrahāyana*) was already solved in the 10th chapter that it was the beginning of the year and the cycle of Sapta Rishi calendar as well. It has nothing to do with the equinox.

From the above understanding, let me now deduce the Mean position of the Solstices and the equinoxes. The Mean winter solstice (Uttarayana) must occur at zero degree Capricorn as per the oscillation of the zodiac caused by the axial precession of the earth.

The Mean position of Uttarayana must occur after the 8th pada south of the maximum extent of Uttarayana which is 4th pada of Dhanishtha in the above illustration. By the rule of Dhanishtha – Rohini angle, only 3 probable positions occur.

For 4th pada of Dhanishtha, the Mean Uttarayana = Abhijit 4th pada

For 3rd pada of Dhanishtha, the Mean Uttarayana = Abhijit 3rd pada

For 2nd pada of Dhanishtha, the Mean Uttarayana = Abhijit 2nd pada.

This makes it mandatory to place Abhijit 2nd pada at zero degree Capricorn. But the illustration shows 3rd pada of Uttarashadha at zero degree Capricorn. This makes the zodiac tilted towards further north (to our right) by 10 degrees (3rd and 4th pada of Uttarashadha and 1st pada of Abhijit).

10 degrees over and above the current Mean tilt is unrealistic and improbable. Moreover the narration in Mahabharata talks only about the change in the position of Abhijit and not about any change in the zodiac or the signs. For these reasons the current view of locating the span of Abhijit (though symbolic) at 6° 40' covering Uttarashada 4th pada and touching Shrivana 1st pada (10° 53' 20") is found to be baseless.

The previous illustration is re-done with above deductions on Dhanishtha – Rohini angle and the Mean Uttarayana for the probable maximum locations of Uttarayana at Dhanishtha.

A notable feature is the presence of Vishakha completely within the sign, i.e. Libra. It was not split in this design and also if we move the zodiac by 10° to our left to align with the Mean position. This strengthens the view that it was originally known as Radha with the succeeding star given the name Anu-radha.

P.Bhadra 1,2,3,4 U.Bhadra 1,2,3,4 Revati 1	Revati 2,3,4 Asvini 1,2,3,4 Bharani 1,2	Bharani 3,4 Rohini 1,2,3,4 Mriga 1,2,3	Mrig 4 Arudra 1,2,3,4 Punar 1,2,3,4
Shravana 4 Dhani 1,2,3,4 Shata 1,2,3,4	Zodiac with Abhijit starting from 06° 40' Capricorn. Krittika has no place in this zodiac. Only 27 stars.		Pushya 1,2,3,4 Aslesh 1,2,3,4 Magha 1
U.Shada 3,4 Abhijit 1,2,3,4 Shravan 1,2,3 Capricorn			Magha 2,3,4 P.Phal 1,2,3,4 U.Phal 1,2
Moola 2,3,4 P.Shada 1,2,3,4 U.Shada 1,2	Anuradha 1,2,3,4 Jyeshtha 1,2,3,4 Moola 1	Chitra 4 Swati 1,2,3,4 Vishakha 1,2,3,4 Radha	U.Phal 3,4 Hasta 1,2,3,4 Chitra 1,2,3

In the above illustration, from Dhanishtha to Rohini represents the limits between Uttarayana and vernal equinox. From Dhanishtha to Abhijit represents the Mean Uttarayana for the three probable locations of Uttarayana.

It can be seen that Abhijit occupied the same location (in the zodiac) of Uttarashada as it is placed today. The 2nd pada of Uttarashada starts from zero degree Capricorn today. 2nd pada of Abhijit too started from the same position (Mean Uttarayana) in the past. Let me show it.

VE			
P.Bha 4 U.Bha 1,2,3,4 Revati 1,2,3,4	Asvini 1,2,3,4 Bharani 1,2,3,4 Rohini 1	Rohini 2,3,4 Mriga 1,2,3,4 Arudra 1,2	Arudra 3,4 Punar 1,2,3,4 Pushya 1,2,3
Dhani 3,4 Sata 1,2,3,4 P.Bha 1,2,3	Uttarayana - V. Equinox Max limit: Dhani 2 - Roh 1 Mean Utta: Abhi 2 - Asv 1 Zodiac before Abhijit was dropped		Pushya 4 Aslesh 1,2,3,4 Magha 1,2,3,4
Abhijit 2,3,4 Shrava 1,2,3,4 Dhani 1,2			P.Phal 1,2,3,4 U.Phal 1,2,3,4 Hasta 1
P.shada 1,2,3,4 U.shada 1,2,3,4 Abhijit 1	Anuradha 4 Jyesh 1,2,3,4 Moola 1,2,3,4	Swati 3,4 Vishakha 1,2,3,4 Anuradha 1,2,3	Hasta 2,3,4 Chitra 1,2,3,4 Swati 1,2

- Mean Uttarayana started in Abhijit 2nd pada. At that time the Vernal Equinox (Mean) occurred at 1st pada of Asvini.

- Maximum limit of Uttarayana was Dhanishta 2nd pada.
- At that limit, vernal equinox occurred at Rohini 1st pada.
- This was the same as in Kritika 1st pada today.
- There is only one location of Uttarayana – vernal equinox for Dhanishtha – Rohini in this design.
- Rohini spreads between Aries to Taurus.
- When the vernal Equinox occurred at Rohini 1st pada, Dakshinayana started at Magha 4th pada. Therefore reference to Soltice at Magha in any olden text should refer to time when Abhijit was part of the zodiac.
- There are remarkable limits to the three positions such that for vernal equinox to occur at Rohini, the maximum extent of Uttarayana was at the 2nd pada of Dhanistha. The only possible position for Dakshinayana was 4th pada of Magha.
- Vishakha was not split in this arrangement.
- But Swati was split at its middle. This reminds us of the verse in Ramayana praising the appearance of Setu Bridge as “*Swati patha*”⁶⁵⁷ – the Madhya Veethi that I earlier explained in the 5th chapter. Swati Patha cuts the zodiac into two equal halves.
- *Swati Patha was the Mean Autumnal Equinox in Skanda’s times*, when Abhijit was part of the zodiac. That idea continued to be in memory in Ramayana times.

In this backdrop let us discuss the reference to Abhijit retiring to the woods, understood as the ‘Fall’ of Abhijit by modern researchers.

THE “FALL” OF ABHIJIT DECIPHERED.

Abhijit 2nd pada was rising at zero degree Capricorn when the vernal equinox occurred at the 1st pada of Asvini at zero degree Aries. At that time Rohini 1st pada was in Aries and Kritika was not part of the zodiac. The equinox was in forward motion (refer the figure titled ‘To and Fro movement of equinox’) in the year 10,301 BCE. **This means right after 10,301 BCE Uttarayana (winter solstice) started moving forward in Capricorn**, or in other words, from Abhijit 2nd pada, to 3rd pada and then to 4th pada and finally to Shravana. By this, Abhijit, the star had slipped back into Aja Veethi, the southern street in course of time!

At the time of Skanda (9990 BCE deciphered earlier from Tamil Sangam texts) Uttarayana advanced by 300 years (10,301 – 9990 = 311). At the average rate of precession derived earlier from Surya Siddhanta verse, (66.66 Years per degree) it is found that the Uttarayana

⁶⁵⁷Vālmiki Ramayana: 6- 22 - 72

and the Vernal equinox advanced by 4.5 degree which is little more than the span of one pada (3.2 degree) of a star. At the time of Skanda Uttarayana started at 3rd pada of Abhijit and not at 2nd pada of Abhijit (which is the median position in the zodiac). The vernal equinox also moved forward into 2nd pada of Asvini.

Among the three stars of a group, Abhijit, Rohini and Hasta (identified as sisters who married Moon), Abhijit and Rohini enjoyed special attention, respectively, for occupying the location of beginning of Uttarayana and part of Aries where Vishuva occurred. But with the passage of time, it was observed that Abhijit was slipping down from the mean position of the Uttarayana while no change was noticed with Rohini. A reading of the verse by Markandeya in Mahabharata reveals this movement observed by the society of the day.

*abhijit spardhamānā tu rohinyā kanyasī svasā
icchantī jyeṣṭhatām devī tapas taptum vanam gatā*

Translated by **Ganguli** this means,

“The lady Abhijit, the younger sister of Rohini, being jealous of her seniority, has repaired to the woods to perform austerities.”

The slipping down of Abhijit from Uttarayana point is perceived as Abhijit retiring to woods, being jealous of Rohini not suffering any change in her status. This is the “FALL” of Abhijit! This is one part of the explanation.

There exists another explanation, in terms of a change in the ecliptic from an elliptical orbit to the current circular one. This was marked by an increase in insolation, bringing an end to the Ice Age and a spurt in melt water pulses that were experienced as sudden sea floods in the time of Skanda. Abhijit appears to be part of the elliptical orbit – which can be visually judged by its location lying to the north of the ecliptic of today. Perhaps the drift in the ecliptic, observed by means of the ‘drift’ in the position of Abhijit over thousands of years was finally reconciled to, as the ‘fall’ of Abhijit from the ecliptic and recorded so in the time of Skanda.

The revelations from this are as follows:

- The observational astronomy had been going on for a long time before Skanda.
- Only if the pre-Skanda society had started observing the celestial position of the stars and conceived the idea of the zodiac from the time Abhijit was at zero degree Capricorn, this kind

of slipping away could have caused distress as revealed in Markandeya's narration of the dialogue between Indra and Skanda.

- The earliest possible time for the evolving interest in Abhijit as the star of Uttarayana could have started from when the 1st pada of Abhijit was rising at Uttarayana. That was from the last 3.20 degree of Sagittarius (which was the 1st pada of Abhijit). This span is roughly equal to 230 years before 10,301 BCE (that is c.10, 530 BCE). But the observation of Abhijit on the elliptical ecliptic must have started thousands of years ago.
- The time of conception of the zodiac with Abhijit at Uttarayana is likely to be around c.10,530 BCE. The zodiac and the analogous story of Moon marrying 27 daughters (stars) of Daksha Prajapati, including Sasi (Abhijit) must have evolved long before this.
- With Abhijit slipping back with advancing Uttarayana, the society had decided to keep Abhijit away from any change or blemish. This idea could occur only if the society had held the star in great reverence. The reference to Abhijit in Vedic texts (that evolved after Skanda initiated the marriage of Svaha and Agni) reveal her high status. To name some of them:
 1. Abhijit was the day “for the gaining of the world of heaven” ⁶⁵⁸
 2. The heavenly connection is further reiterated in Mahabharata in Bhishma's sermon on the arrow bed. While associating different kinds of results for charity done on the days of different stars, attainment of heaven is mentioned by Bhishma only in the case of charity done on Abhijit day. ⁶⁵⁹
 3. Similarly while enumerating the results of doing optional shraddha ceremony for departed ancestors, Abhijit is associated with acquirement of knowledge. ⁶⁶⁰
 4. Offerings were done to Abhijit on the third year (of the 5 year Yuga) – year that is midpoint of the 5-year Yuga. ⁶⁶¹ The midpoint also matches with Abhijit being spread on both sides of the Uttarayana in mean position, or in other words Uttarayana falling in the middle of Abhijit which was the case in Skanda's time, when a re-think on Abhijit was made.

The salient features are

- Uttarayana started after the 2nd pada of Abhijit or in the middle of Abhijit in Skanda's times. It was also noted that Arundhati had not deviated from her path, of following Vasishtha!

⁶⁵⁸ Krishna Yajur Veda: VII- 5.1

⁶⁵⁹ Mahabharata: 13-64

⁶⁶⁰ Mahabharata: 13-89

⁶⁶¹ Krishna Yajur Veda: V-6.5

- A catastrophe was witnessed by that time or before that time (to be discussed in the course of this chapter) that it was felt that Kritika could be elevated as a star of the zodiac (one among the 27 stars) by dropping Abhijit from the counting.
- Since the society could not stomach the loss of importance to Abhijit as the star of Uttarayana, it decided to freeze Abhijit at the mid-point location, from the 3rd pada as it was at the time of Skanda. It seems this was mistaken as the 3rd pada in Capricorn (after 6.40 degree) and continuing in tradition now, while in fact it could be the 3rd pada of Abhijit spread between 3.20 and 6.40 degree of Capricorn.
- The mid-point nature of Abhijit was frozen in memory by the Vedic society later which we see in the naming of the mid-day as Abhijit Muhurtha!

Abhijit Muhurtha.

Abhijit was splitting the zodiac into two halves between the two equinoxes when its 2nd pada started at zero degree Capricorn. That mid-position was recognisable in 10,300 + BCE. That mid-position was retained in memory as Muhurtha at mid-day. The ‘Swati Patha’ (the midpoint of Autumnal equinox when Abhijit was part of the zodiac) reference in Valmiki Ramayana is proof of the attachment the olden society had for things held high in far olden days. Nilesh Oak as usual had made his own interpretations, without any discriminatory sense of perception on whether a reference to Abhijit pertains to a Muhurtha or a star.

- Even after discarding Abhijit from the zodiac, the society had retained the name to refer to the mid-day Muhurtha at local time. This starts from 1 ghati before noon at local time and ends 1 ghati after that. So wherever mid-day reference appears in the context of Abhijit, one must check if it refers to Abhijit Muhurtha.
- In astrology, Abhijit Muhurtha is known as Vijaya Muhurtha or Brahma Muhurtha or Kutup Muhurtha.⁶⁶² Therefore one can expect words like Vijaya associated with Abhijit to refer to the Muhurtha.
- The rationale of mid-day attributed to Abhijit Muhurtha has risen from having held Abhijit as a Mean Uttarayana star.

Ramayana references about Abhijit

In Ramayana, Rama refers to Abhijit Muhurtha as Vijaya Muhurtha while starting for war.

“This is suitable Muhurtha for Vijaya; the sun has reached mid-day”

(युक्तोमुहूर्तोविजयःप्राप्तोमध्यमदिवाकरः)⁶⁶³

⁶⁶²“Abhijin Muhurt – and Limitations Thereof” by V.K. Sridhar.

⁶⁶³ Valmiki Ramayana: 6-4-3

- Yet another verse in Valmiki Ramayana says that the Vanaras were waiting for “*Abhijit Abhimukha*” to start their journey towards South.⁶⁶⁴ This is a clear reference to the Muhurtha which ensures victory particularly when they have to travel towards the South known for inauspiciousness owing to be abode of Yama. Naturally they had waited for the auspicious time to start.
- But Nilesh Oak who never misses a chance to relate an astral term to astronomy event, reasons out that it is “*true that practically every Sanskrit verse can be translated in multiple different ways resulting in multiple interpretations*” and provides his own “*meaningful translation*” that it refers to the Northern Pole star.⁶⁶⁵ Per his interpretation, the Vanaras started off for their search “*in the presence of nakshatra अभिजित्*” that was “*a reference star, employed by Vanara search party, in their journey to the south as they searched for Sita.*”
- This gives an opinion that the search was done at night time because only at night they could have sighted Abhijit and using it as a reference star moved towards south.
- But the context is that of meeting Sampāti and starting the search on his advice. All this had happened in broad day light. Only the sun was the guide for directions in the day time. They waited for the Sun to reach mid havens (Abhijit Muhurtha) and then started off. If Nilesh Oak insists that it was night time, he has to prove it, besides giving evidences that the Vanaras searched at night time too. At night-time search, Moon was the guide, a feature known from the search by Hanuman after moonrise.
- Yet another verse of Valmiki Ramayana is quoted by Nilesh Oak in his blog stating that it gives a broader time line that he prefers to call as the “Epoch of Ramayana”⁶⁶⁶

The verse is

brahmarāśir viśuddhaś ca śuddhāś ca paramarṣayaḥ
arciṣmantah prakāśante dhruvaṃ sarve pradakṣiṇam.⁶⁶⁷

There is no dispute over the fact that Abhijit is referred to as the Brahmarashi in this verse.

The issue is Nilesh Oak equates Abhijit with the Pole star in this verse.

The verse first refers to Abhijit (Brahmarashi) looking clear. And then tells the same for the great Rishis (sapta rishis) and all of them circumambulating the Pole Star (Dhruva).

⁶⁶⁴Valmiki Ramayana: 4-63-15

⁶⁶⁵“On the identification of Brahmarashi with nakshatra Abhijit”<https://nileshoak.wordpress.com/2016/10/07/on-the-identification-of-brahmarashi-with-nakshatra-abhijit/>

⁶⁶⁶Ibid.

⁶⁶⁷Valmiki Ramayana: 6-4-49

The mistakes in Oak's version are that (1) Abhijit and Pole star were not the same in this verse. They were different. (2) On Oak's date of Ramayana, simulated in the western astronomy software, the Sapta rishis were not circling around the Pole star, but were moving from eastern to western horizon for all latitudes of India. For the period before c.9000 BCE the Sapta rishis were outside circumpolarity and this locates the above verse of Ramayana any time after c.9000 BCE and not before.

The so-called 'Epoch of Ramayana of Nilesh Oak is also false because the Saptarishis were not circulating the NCP in that 'Epoch' but Ramayana says that they were going round the NCP.

The love for Abhijit had continued down the ages with Krishna identifying himself with Abhijit among the stars! Though he uses the name "Śaśī" in his discourse to Arjuna,⁶⁶⁸ he does mention Abhijit for the same in his discourse to Uddhava.⁶⁶⁹

"Śaśī" was the original name of Abhijit as one among the 27 stars.

Its importance was retained as a mid-day Muhurtha in Mahabharata times too. The corresponding mid-night Muhurtha is known as "Śaśī"! It is probable that after Śaśī was dropped from the 27 star-group she was renamed as Abhijit.

Nilesh Oak has failed to check the Mahabharata verse claiming that Yudhishtira was born in Abhijit Muhurtha.⁶⁷⁰

The interesting feature of this Muhurtha is that though it is auspicious on all days, it is not so in the mid-day of the week, astrologically speaking.⁶⁷¹ Wednesday is the mid-day of the week and Abhijit Muhurtha of this day is not auspicious. This gives rise to the view that there was something obsessive about the "middle".

Only if the society had watched Abhijit high in the sky which at the same time coincided with the Mean position of Uttarayana (in the middle of two equinoxes), this obsession with Abhijit is justifiable.

Around 10,800 BCE Uttarayana started sliding up from Uttarashada to Abhijit, but then the star slipped down in Skanda's times and the society must have gained the grasp of the

⁶⁶⁸Bhagavad Gita: 10-21

⁶⁶⁹ Srimad Bhagavatam: 11-17-27

⁶⁷⁰ aindre candrasamāyukte muhūrte 'bhiḥjite 'ṣṭame
divā madhyagate sūrye tithau puṇye 'bhipūjite (MB: 1-114-4)

<http://www.sacred-texts.com/hin/mbs/mbs01114.htm>

⁶⁷¹ "Muhurtha" by B.V.Raman. Page 28

movement of the solstices and equinoxes. For a society infatuated with Abhijit, the inevitable dawned on them that Abhijit cannot continue to be the start of Uttarayana forever. By pulling it out of the zodiac and keeping its relevance to Muhurtha they thought they can retain its greatness for all times to come. This made them choose Kritika as the foremost star of the zodiac at a distance of 90 degrees from Dhanishtha by pushing Rohini away from the primary position.

Bringing in Kritika also solved the problem of completing the star count of the zodiac arising from the inevitable event of having to remove Abhijit from the zodiac. So what happened then? What made them choose Kritika and not any other star near the ecliptic?

10,800 BCE witnessed a comet-hit.

Markandeya's narration speaks about a second catastrophe that smacks of a comet falling from the sky. Though this is characterised as Danavas fighting with Devas, the description speaks about hills, rocks, fire balls and *parigha* falling towards the direction where Sankara (Shiva) and other celestials stood.⁶⁷² The chief among the enemies is identified as **Mahisha** who was described as hurling hillocks at the Devas.⁶⁷³ The sage says that unable to protect themselves from the army of Mahisha, Rudra prompted Skanda to attack him and his army. Skanda shot his weapon Shakti that broke into pieces the head of Mahisha. Translating the verses **Ganguli** writes,⁶⁷⁴

“That missile cut off the head of Mahisha, and he fell upon the ground and died. And his head massive as a hillock, falling on the ground, barred the entrance to the country of the Northern Kurus, extending in length for sixteen Yojanas though at present the people of that country pass easily by that gate.”

Skanda repeatedly sent his weapon and killed other invaders too. This led to Rudra declare that Skanda must be seen like himself from then onwards (*rudreṇa skandaṃ paśyata mām iva*)⁶⁷⁵

This story has allegorical parallel to the fall of a comet that caused massive and widespread damage in the northern hemisphere (land of Devas in the story) leading to global firestorms, bio-mass burning, extinction of life forms, such as mammoths. This caused cooling of the

⁶⁷²Mahabharata: 3-221-34 <https://www.sacred-texts.com/hin/mbs/mbs03221.htm>

⁶⁷³Mahabharata: 3-221-52, 53 <https://www.sacred-texts.com/hin/mbs/mbs03221.htm>

⁶⁷⁴Mahabharata: 3-230 <https://www.sacred-texts.com/hin/m03/m03230.htm>

⁶⁷⁵Mahabharata: 3-221-78 <https://www.sacred-texts.com/hin/mbs/mbs03221.htm>

earth by 2 to 6 degrees Celsius resulting in a period termed as ‘*Younger Dryas*’ – with a brief return of Ice age conditions for a 1000 years.

Today the scientific community had come to a unanimous agreement that this was caused by a comet hitting the earth around 10,800 BCE.⁶⁷⁶ It is even speculated that this event is expressed in one of the stone carvings at Gobekli Tepe.⁶⁷⁷ The comet has hit Greenland but its fragments fell on a wider area causing nearly 10% of the earth experience wild-fires. The comet’s fragment was found to have fallen in southern hemisphere too, at 40 degrees South in Chile.⁶⁷⁸

So far nothing has been heard of this hit in India, but we have *three evidences from Mahabharata*, one in the narration of Markandeya explained above, another in the reply given by Bhishma from his arrow bed to a question by **Nakula** on the origin of the ‘sword’- the weapon considered to be foremost among all the weapons and the third in the narration of Bhishma of Vasishtha’s version on the transfer of Agni, the seed of Shiva to Ganga.⁶⁷⁹ All these have the trappings of the comet-hit or an asteroid-hit witnessed or experienced at the time Skanda lived.

It sprang from scattering flames, looked tall and exceeding in energy. When it struck, the earth trembled, oceans agitated and meteors fell from the sky. From the image of the fall of a comet or asteroid, the sword seems to have been designed.



⁶⁷⁶ “12,800 Years Ago, Earth Was Struck by a Disintegrating Comet, Setting Off Global Firestorms”
<https://www.universetoday.com/138463/12800-years-ago-earth-struck-disintegrating-comet-setting-off-global-firestorms/>

⁶⁷⁷ “Ancient stone carvings confirm how comet struck Earth in 10,950BC, sparking the rise of civilisations”
<https://www.telegraph.co.uk/science/2017/04/21/ancient-stone-carvings-confirm-comet-struck-earth-10950bc-wiping/>

⁶⁷⁸ “More evidence of a comet catastrophe 13,000 years ago, this time from South America”
<https://www.dailygrail.com/2019/03/more-evidence-of-a-comet-catastrophe-13000-years-ago-this-time-from-south-america/>

⁶⁷⁹ Mahabharata: 13-84 – verses 55-56 <https://www.sacred-texts.com/hin/mbs/mbs13084.htm>

The most intriguing part of the narration by Bhishma is that the ‘sword’ was born under the constellation of Kritika; Agni was its deity and Rohini was its Gotra!!

kṛttikāś cāśya nakṣatram aser agniś ca daivatam
rohiṇyo gotram asyātha rudraś ca gurur uttamah⁶⁸⁰

Does this refer to the comet-fall on a Kritika day? Rohini becoming the Gotra is another intriguing feature that conveys Kritika comes under the family of Rohini or evolving from under Rohini!

The shape of the sword and the power of the sword hitting on all sides seem to have been inspired by the shape of the comet falling on the earth. The name of Kritika in the Gotra of Rohini appears to convey that the comet hit had happened on a day when Rohini was reigning in the previous zodiacal design where Kritika was not included.

1. Kritika in, Rohini away, Abhijit out and Vishakha split!

From the initial look of it, the choice of Kritika to replace Abhijit does appear to be a needless one given that it is a dim group of stars which easily escapes observation. For a visual observer, in the span of the sky from Asvini to Kritika, the zodiacal stars do not appear in regular distance from each other. Unless otherwise there were compelling reasons to choose Kritika, the ancients could have gone ahead with the regular Dhanishtha – Rohini in supremacy and include some other star near the ecliptic to make for the loss of Abhijit.

Rohini has been held in high esteem for all these ages as an auspicious star.⁶⁸¹ Even a smallest obstruction caused to it by a passing planet or meteor is treated as indicative of a calamity in astrological predictions. This view could have gained currency right from the time the comet/asteroid hit the earth on a Rohini day. Some of the arguments in justification of pushing away Rohini to position Kritika in its original place are as follows:

- At that time the ancients were already taunted with worries over the changing position of Abhijit that slipped down from Uttarayana.
- The society that was wondering about how to re-work the zodiac was hit with another calamity in the form of a comet hit. And if only that calamity had taken place on a Rohini day, they could have thought about protecting the identity of Rohini as an auspicious, but not a calamitous star.

⁶⁸⁰ Mahabharata: 12-160-80 <http://www.sacred-texts.com/hin/mbs/mbs12160.htm>

⁶⁸¹ The Tamils of Sangam Age conducted marriage specifically on Rohini day only.

- Rohini that was supposed to bring growth and prosperity, if brought out death and destruction contrary to its assigned nature, then it is perfectly justifiable to move her a little and give way for another upon whom death and destruction can be assigned.
- With Krittika in the neighbourhood of Rohini as seen from the earth, its inclusion also serves as a replacement for Abhijit.

2. Krittika seemed to have fulfilled some important requirements.

1. The comet hit on the Rohini day can be technically altered by positioning Krittika at where Rohini was located in the zodiac.

P.Bha 4 U.Bha 1,2,3,4 Revati 1,2,3,4	Asvini 1,2,3,4 Bharani 1,2,3,4 Rohini 2,3,4 Krittika 1	Rohini 2,3,4 Mriga 1,2,3,4 Arudra 1,2	Arudra 3,4 Punar 1,2,3,4 Pushya 1,2,3
Dhani 3,4 Sata 1,2,3,4 P.Bha 1,2,3	Uttarayana - V. Equinox Max limit: Dhani 2 - Roh 1 Mean Utta: Abhi 2 - Asv 1 Zodiac before Abhijit was dropped		Pushya 4 Aslesh 1,2,3,4 Magha 1,2,3,4
Abhijit 2,3,4 Shrava 1,2,3,4 Dhani 1,2			P.Phal 1,2,3,4 U.Phal 1,2,3,4 Hasta 1
P.shada 1,2,3,4 U.shada 1,2,3,4 Abhijit 1	Anuradha 4 Jyesh 1,2,3,4 Moola 1,2,3,4	Swati 3,4 Vishakha 1,2,3,4 Anuradha 1,2,3	Hasta 2,3,4 Chitra 1,2,3,4 Swati 1,2

Krittika in the place of Rohini.

As a result, Krittika's 1st pada becomes the last pada of Aries at which the maximum extent of Vernal equinox occurs. The re-designed zodiac with this replacement pushes Rohini well into Taurus. Vishakha that was never branched in between the zodiacal signs, now appear branched or split much in tandem with the birth of 'Vishakha' by the blow (Vajrayudha / thunder bolt) of Indra and Agni spewed by Skanda to counter the blow. Expectedly Indragni is recognised as the deity of Vishakha.

Abhijit whose 2nd pada appeared at mid-point of the equinoxes had to give way for Uttarashada after making a quiet exit. The re-designed zodiac is shown in the following diagram. This design continues to be in vogue till date.

P.Bha 4 U.Bha 1,2,3,4 Reva 1,2,3,4	Asvini 1,2,3,4 Bhara 1,2,3,4 Krittika 1	Krittika 2,3,4 Roh 1,2,3,4 Mri 1,2	Mri 3,4 Arudra 1,2,3,4 Punar 1,2,3
Dhani 3,4 Sata 1,2,3,4 P.Bha 1,2,3	Re-design of the zodiac after 'Fall' of Abhijit. Krittika in. Rohini to the next slot. Abhijit out. Vishakha split.		Punar 4 Pushya 1,2,3,4 Aslesha 1,2,3,4
U.shada 2,3,4 Abhijit Shrav 1,2,3,4 Dhani 1			Magha 1,2,3,4 P.Phal 1,2,3,4 U.Phal 1
Moola 1,2,3,4 P.shada 1,2,3,4 U.shada 1	Vishakha 4 Anu 1,2,3,4 Jyesh 1,2,3,4	Chitra 3,4 Swati 1,2,3,4 Vishakha 1,2,3	U.Phal 2,3,4 Hasta 1,2,3,4 Chitra 1,2

3. Krittika offered new identity for the spouses of six of the sapta rishis.

The abandonment of the six *rish-patnī*-s is also a feature noticed in Skanda's times. The change in their position is revealed in the impersonation done by Svaha which however could not be repeated in the case of Arundhati. This indicates that some stars were initially recognised as the spouses of six sages of the Saptarishis. However their identity is not discussed anywhere in the texts.

There is also an unrealistic element in this description as the change in the position of six stars is not palpable for thousands of years. However the slipping away of Abhijit being the cause of all consternation and substitution of the same with Krittika (Pleiades) having six stars, we are left wondering whether Abhijit was treated as a group of six spouses of the six rishis who along with Arundhati accompanying her husband circulated the Dhruva. Abhijit always present in high northern latitudes and circulating the Pole stars spread within the span of 54 degrees (as per derivation from Surya Siddhanta verse) in the company of Sapta Rishi Mandala, it sounds plausible that Abhijit was also considered as a group of the six rishi patnis.

Once Abhijit was abandoned, the ancients had looked for a 'stable' star group that can be linked up with the Sapta Rishis as spouses. Giving credence to this conjecture is a reference found in Satapatha Brahmana that the seven sages married the Krittika stars!⁶⁸² This idea is also reflected in the Marriage mantras during the sighting of Arundhati!

⁶⁸² Dr Subhash Kak, "Babylonian and Indian Astronomy: Early Connections." (2003) Page 29

Recalling the meaning of the mantra discussed in the 1st chapter, Arundhati, the spouse of Vasishtha always remained following her husband. The other six spouses were also stable as the six Krittika stars! This idea about Krittika stars must have come up only after Krittika was included in the zodiac to replace Abhijit in Skanda's times! The star-spread of Krittika and that of the Sapta Rishis (Big Dipper) offer a marvellous resemblance to one another.



The six Krittika stars resemble the shape of the Sapta Rishis. So the choice of Krittika was so apt as to replace Abhijit that was treated as a single group of six spouses.

4. Krittika ruled high in the Heavens when Abhijit 'fell' behind the forests.

The choice of Krittika, an obscure star group as a substitute for a glowing Abhijit seemed to have been prompted by its elevation in the sky. Astronomy simulations are of help here.

When checked in Stellarium, it is found that Krittika was at zenith when the Sapta rishis were rising, but Abhijit was setting! This was true for Vedic dates of to and fro limits of times (and also in the western astronomy precessional past for the year 10,000 BCE)

The simulation for both Vedic dates of 54 degree limits and western astronomy dates shows the Sapta Rishis and Krittika together for quite some time in the sky on any day of the year. In contrast Abhijit by virtue of its position in the sky opposite to the Sapta Rishis, disappeared short time after the Sapta Rishis rose up in the sky. This was immortalised into a story of the six wives seeming to run away due to impersonation and the six sages abandoning their spouses on account of it. Only Arundhati kept constant company with her husband. By rising early and setting late she set a model for an ideal wife, the *pativrata* and therefore was celebrated in all the three worlds. Could she ever transgress from her position? Could anyone in the know of Vedic tradition ever imagine that Vyasa did indeed refer to a transgression committed by her? I leave it to the readers' judgement.

5. Krittika's inclusion to match with the shower of fire from comet-hit.

The choice of Krittika also reveals the basic concept behind stars as time keepers. Nilesch Oak causally states that Nakshatra system of time keeping was well established at the time of Mahabharata, as an assumption⁶⁸³ without explaining what it means. Many people think that the division of the sky into 27 star segments help in tracking the motion of the sun and the moon in specific time intervals.

The true import of the nakshatras perceived by our ancients is revealed in placing Krittika on a Rohini day such that the comet fire engulfed the earth on Krittika, and not on Rohini day. That is because a nakshatra – which is nothing but a self-illuminating Deva – awards the good or bad that it is supposed to give. The Nakshatra ‘times’ the events to be experienced by the people, as and when coming into contact with the sun, the moon or the planets (graha). Naksh, the root word of nakshatra meaning ‘obtain’, ‘attain’, ‘get’, ‘arrive at’ etc., stands for timing the fruits of karma to be obtained by people.

For example, Rohini, the star of the deity Prajapati delivers growth and prosperity to the praja, the people as a father does to his children. When Moon crosses it, this deity causes to obtain prosperity. But alas a terrible fire ball descended on the earth on a Rohini day, which runs counter to the ‘timing’ of the stars!

Those were the times people were keenly watching the celestial sphere and matching them with terrestrial events. The fire on Rohini had upset their conjectures. For quite some time they must have observed the region of the sky from where the fire-ball descended and must have come to the conclusion that that part of the celestial sphere is fit to be assigned to the Fire God and thus was born the Agni Deva, the deity of Krittika. This necessitated the moving away of Rohini in spite of her being the foremost star in Brahma's scheme along with Dhanishtha.

In comparison Abhijit had never caused any agony. The only problem with it was slipping away from the high position at Uttarayana. The fruits ‘obtained’ (naksh) from it are sought to be obtained when the sun came into contact with the mid-point in the sky. Thus was born the Abhijit Muhurtha.

It is for the reason of obtainment of specific results Rama chose to march towards Lanka on Purva Phalguni,⁶⁸⁴ Lakshmana was happy that there was no evil influence on Vishakha the

⁶⁸³“When Did The Mahabharata War Happen?” Page 13.

⁶⁸⁴Valmiki Ramayana: 6-4-5

star of their dynasty, Karna was worried that the Graha (moon) of the Prajapati nakshatra (Rohini) was afflicted by Saturn and Vyasa was worried that Arundhati appeared to change her position from normal!

Each one of these references found in the Epics conveys the results expected at the moment, ‘timed’ by the respective nakshatra. (They are not astronomy observations done for record purpose, as Nilesh Oak thinks.) Of these Arundhati stands apart for she is not part of the ecliptic to be traversed by planets or the luminaries (sun and moon) to cause mankind get the result – and the result being *pativratātva*! Just by looking at her and contemplating on her one can fashion oneself in the path of *pativratātva*.

Such a star seemed to have changed her position- said the worried Vyasa thinking of the transgressions that women would have to make in the event of losing their husbands on account of the war – a predicament that caused Arjuna refuse to fight. *Such appearance of Arundhati could only be momentary, like all the other so-called ‘astronomy’ references that were related to some result.*

Abhijit also stood apart, as a star ensuring **Vijaya**, and that must have made the ancients include it in the ecliptic. But alas ever since it started slipping down from the Uttarayana - something the ancients had not originally contemplated and hence gone into thoughtful mode on what to do about it. This deduction makes me declare that the final design of the zodiac was done around the time Uttarayana started in Abhijit. That was around 10,600 BCE.

10,800 BCE Comet-hit impacted India too.

The last event of ‘adjustment’ by including Krittika prompted by the comet-hit pre-supposes that India also received the fiery canons of the comet. The completely undetected regions that received the fiery fragments of the comet must have been immortalised into another legend of self-immolated body parts of Sati Devi falling in different parts of India. Most of them fell in northern section towards the direction of Mount Kailash, the abode of Shiva – having a parallel in Markandeya’s narration to the fiery rocks falling at where Sankara stood.

Yet another parallel pertains to Sankara retiring to “*Bhadravata*”⁶⁸⁵ after Skanda won over Mahisha. In the legend of Sati Devi’s body parts falling scattered, the same deity Sankara was recognised as “*Virabhadra*”. Although the impact regions were glorified as Shakti-Peetha, the underlying event seems to be the same.

⁶⁸⁵Mahabharata: 3-221- 1 &78

Not to be left out is the **Arbuda Devi** on Mount Abu that has the stamp of a fiery fragment of a comet or asteroid falling on the mountain. The local legend claims that the Devi is still hanging in 'mid-air'. A Rig Vedic verse on Indra piercing through Arbuda with frost appears to be an allusion to pouring down water on the fiery Arbuda!⁶⁸⁶

Adbhuta was the fire in Skanda's legend that was described as aiming to destroy itself. The society which was not well aware of the ways to grow fire with huge flames, after experiencing the fire-balls from the sky and wild-fires caused by them, had started to praying to Fire God to protect them from destruction, and help them to grow in prosperity. That was the aim of the Agni Upasana, initiated by Skanda and kept warm throughout the millennia.

The comet-hit of 10,800 BCE matching with the catastrophe from the sky that ultimately gave Skanda the designation as the celestial commander in chief, and the spread of Adbhuta fire and the splitting of Vishakha caused by fire - all happening around the same time offer the foundation for Skanda legends. However between 10,800 BCE and 9990 BCE (the date of Skanda deduced from the Tamil sources) there is a long gap of 800 years. But before that, we can be certain about the design of the zodiac as early as 10,600 BCE. The gap is only 200 years then, and with the date of comet-hit being fixed around the same time with a variation of a few centuries, it is deduced that the Pre-Skanda society witnessed the comet hit.

Reclamation happened in the aftermath of the comet-hit, thanks to Skanda whose list of reforms included development of Tamil and Sanskrit besides the introduction of Vedic Homa as a way of prayer to Agni, not to destroy but to develop the seeker. And all the after-effects were blended around Skanda as he happened to the valiant persona of the times that followed the calamity. The Vedic society elevates the great among men as a God and Skanda was the first man elevated into Godhood. Rama and Krishna were later inclusions.

In the final analysis, Abhijit reference is not only about a long past of Vedic culture, but also a hint to pinpoint the exact time of birth of the Vedic culture.

⁶⁸⁶Rig Veda: 8-32-26
 ahan vṛtram ṛcīṣama aurnavābhamahīśuvam |
 himenāvidhyadarbudam ||

Appendix I

List of Manipulations done by Nilesh Oak to ‘corroborate’ his date of Mahabharata.

Very often one finds Nilesh Nilkanth Oak claiming in public platforms and social media that he has successfully corroborated 300+ astronomy references of Mahabharata for his date of Mahabharata War in the year 5561 BCE. Here I am giving the true picture of the nature of his claim. Even before we venture to check his corroborations, the reader must be informed that Nilesh Nilkanth Oak had not even corroborated the major highlights of Mahabharata – despite claiming the text to be factual. In the 9th chapter of his book, he has given “six specific observations of Mahabharata and one traditional belief (Kali Yuga and the Mahabharata War) conflicting” with his theory and / or proposed time line.⁶⁸⁷

Mahabharata observation	Nilesh Oak	Jayasree Saranathan
Balarama Tirtha Yatra starting on Pushya and ending on Shravana after 42 days	Not corroborated	Corroborated
Late Moonrise on 14 th day of War	Not corroborated	Corroborated
Bhishma passing away on Magha Shuddha Ashtami after 58 days with pain of arrows	Not corroborated	Corroborated
Traditional date of Kali Yuga	Not corroborated	Corroborated
Bhishma compared with Full moon on 1 st day of war	Tried unsuccessfully to corroborate	Analogy, so didn't attempt to corroborate
Analogy of solar eclipse on 18 th day of war	Tried unsuccessfully to corroborate	Analogy, so didn't attempt to corroborate
Krishna left for peace mission at the end of Sharad season.	Not corroborated	Corroborated

The above table raises a question how Nilesh Oak can claim success in his research when five major events of Mahabharata were not corroborated by him for his timeline. While we appreciate his openness in accepting that he had not corroborated these events, we are constrained to express our doubts about his integrity and proficiency in the text for all the

⁶⁸⁷“When Did The Mahabharata War Happen?” Page 120-121.

other ‘corroborations’ he had done in his book. Let me first highlight the 7th chapter of his book titled “The planets were aligned.” There are 18 planetary observations he has dealt with in this chapter by naming them as experiments numbered from 10 to 27. Let me show that all of them are manipulated to fit-in with his date.

(1) Experiment No 10: “Jupiter and Saturn near Visakha”.⁶⁸⁸ (Mahabharata reference No 6 in his book)

“grahau tāmraṇa śikhau prajvalantāv iva sthitau
saptarṣīṇām udārāṇām samavacchādyā vai prabhām”
samvatsarasthāyinau ca grahau prajvalitāv ubhau
viśākhayoḥ samīpasthau bṛhaspatiśanaiścarau”⁶⁸⁹

He has taken the last line of this verse and attempted to locate Jupiter and Saturn in the Voyager Simulator by means of DVA (Direct Visual Astronomy which “*involves simulating movement of the object of interest, as seen from a specific location on the earth*”)⁶⁹⁰ When he checked for the 1st day of the war (when this observation was purported to be made) “Jupiter stayed in the region of *Mula- Uttarashada*, Saturn stayed in the region of *Chitra – Uttara Phalguni*”. But he “treated this as a satisfactory corroboration of this Mahabharata observation”. How?

He reasons out that Jupiter and Saturn were equi-distant from Visakha, in nakshatra space, east and west of Visakha respectively!! Jupiter was near Mula and Saturn was near Hasta, each at a distance of more than 2 nakshatra space (>27°) from Visakha!

The questions that arise are

What is the extent of ‘sameepa’ in Vyasa’s astronomy in this verse? Without defining this how could a scientific researcher proceed to locate a planet in ‘sameepa’ (near) of some star? If Jupiter was in Mula, Vyasa could have written that it was in Mula. Why should he write that it was nearing Visakha which is more than 2 nakshatras away? Similarly why should Vyasa say that Saturn was nearing Visakha while it was 2 stars away from Vishakha.

⁶⁸⁸“When did the Mahabharata war happen?” Page 79

⁶⁸⁹Mahabharata: 6-3- 24 & 25 <http://www.sacred-texts.com/hin/mbs/mbs06003.htm>

⁶⁹⁰“When did the Mahabharata war happen?” Page 77.

But Nilesch Nilkanth Oak finds the position of Jupiter and Saturn a corroboration of Vyasa's observation that they were near Visakha!! Anyway he has safely written earlier that the "Determination of the Nakshatra of any given day based on visual observation can lead to an error of +/-1day"⁶⁹¹ This experiment shows more than 2 nakshatras in a given day. It doesn't matter as it can be added in the next edition of his book.

According to him Experiment 10 is successful corroboration of planetary alignment on his date of Mahabharata – notwithstanding the fact that Jupiter can never come near Visakha with Sun in Jyeshtha (as it entails vakri motion) and it will take 11 to 12 years for Jupiter to come near Visakha. In the case of Saturn, it will take more than one and a half years to come near Vishakha!

This being the 'scientific' nature of corroborating the verse, whom does he want to satisfy by making this experiment? For him "this was merely a verification of Vartak's explanation". So the reader can rest assured he had not proved Vyasa's verse!

(2) Experiment number 11: "Saturn near Bhaga" (Mahabharata reference No 10 in his book).

The verse runs as follows:

bhāgyam nakṣatram ākramya sūryaputrena pīdyate⁶⁹²

Nilesch Oak writes,

"Voyager simulation shows that Saturn is near Bhaga (*Uttara Phalguni*) for a period of more than two years leading to the first day of Mahabharata War, when it began approaching *Chitra*."⁶⁹³

What is wrong with this?

The issues are:

Nilesch Oak does not define the word 'Pidyate' in the verse. It is too essential to know the meaning as it refers to Saturn in third case (Instrumental case - Surya putrena). The dictionary meaning of 'Pidyate' is hurt or be pressed or afflicted. So 'Surya putrena Pidyate' refers to an affliction or harm caused by Saturn (son of Surya). How could 'Pidyate' be taken to mean "near"? Oak must explain why he interprets 'Pidyate' as 'near'.

⁶⁹¹"When did the Mahabharata war happen?" Page 36.

⁶⁹²Mahabharata: 6-3-14 <http://www.sacred-texts.com/hin/mbs/mbs06003.htm>

⁶⁹³"When did the Mahabharata war happen?" Page 79.

Nilesh Oak has aligned Bhaga with Uttara Phalguni. But Bhaga is the presiding deity of Purva Phalguni. For Uttara Phalguni the deity is Aryama. The Rig and Yajur Vedanga Jyothisha give the list of the deities for stars in the sequence starting from Krittika. Per that Bhaga was the presiding deity of Purva Phalguni and Aryama was for Uttara Phalguni. Earlier we proved in the context of the 5-year Yuga that the Vedanga Jyothisha was in vogue in Mahabharata times. Therefore a reference to Bhaga must align it with Purva Phalguni and not Uttara Phalguni.

*agnih prajāpatiḥ somo rudro 'ditir brhaspatiḥ|
 sarpās ca pitaraś caiva bhagaś caivāryamāpi ca||
 savitā tvaṣṭātha vāyuś cendrāgni mitra eva ca|
 indro nirṛtir āpo vai viśvedevās tathaiva ca||
 viṣṇur vasavo varuṇo 'jaekapāt tathaiva ca|
 ahirbudhnyas tathā pūṣā aśvino yama eva ca||
 nakṣatradevatā hy etā etābhir yajñakarmanī
 yajamānasya sāstrajñaiḥ nāma nakṣatrajam smṛt(m||
 (R-VJ 25-28 ; Y-VJ 32-35)*

Long after he published his book, Oak makes a mention of the reversal of the two deities Bhaga and Aryama for the two Phalguni stars in a different context in his blog written on October 2016,⁶⁹⁴ quoting Taittiriya Samhita and Taittiriya Brahmana. But there is no discussion in his book or anywhere else on the exact stellar ruler ship followed at the time of Mahabharata war.

Without giving any justification or explanation for which of the deities ruled the two stars, he had written Bhaga and Aryama for both the Phalguni stars in Table 3 on stars and nakshatra devatas for the year 5561 BC. Since the text talks about “Bhagyam nakshatram”, the star ruled by Bhaga assumes significance.

⁶⁹⁴“On the identification of Brahmarashi with nakshatra Abhijit”
<https://nileshoak.wordpress.com/2016/10/07/on-the-identification-of-brahmarashi-with-nakshatra-abhijit/>

Table 3
Nakshatra, Nakshatra Devata, Modern star, R
(5561 B.C.)

Nakshatra	Yoga Tara	Nakshatra Devata	RA	DEC
			arc-sec	arc-sec
Punarvasu	Pollux	Aditi	25,200	35,040
Pushya	Altarf	Brihaspati	81,900	(7,440)
Ashlesha	zeta Hydraz	Nagin/Sarpah	117,900	3,900
Magha	Regulus	Pitarah	156,600	61,800
Purva-Phalguni	Zosma	Aryaman (Bhaga)	180,000	120,480
Uttara Phalguni	Denebola	Bhaga (Aryaman)	229,500	124,980
Hasta	Algorah	Savitar (Sun?)	323,100	44,820
		Tvashta (Indra)	361,800	79,380

Nilesh Oak should have proved which of the two Phalguni stars were ruled by Bhaga in Mahabharata astronomy. In the absence of that he stands to be accused of picking up what suits him with his Simulator Nyaya.

Nilesh Oak says that simulation shows Saturn near Uttara Phalguni for 2 years (to justify the reference to Bhagyam nakshatram) and continues to say that Saturn began approaching Chitra on the first day of his date of Mahabharata war! This means Saturn was near or at the star *Chitra* on his date which is a clear contradiction to Vyasa's observation of Bhagyam nakshatram.

Even if we assume that Saturn was near Uttara Phalguni as he initially claims from the simulator, Saturn has to cross Hasta before reaching Chitra. This means it will take nearly a year for Saturn to reach Chitra – the position on the day of Oak's date of Mahabharata war – from Uttara Phalguni. Then how could he claim that he has successfully corroborated Vyasa's verse on Saturn's position near Bhaga?

From Bhaga (lord of Purva Phalguni in 5 year Yuga calendar) it will take not less than 2 years to reach Chitra – on the first day of Mahabharata war (Oak's date). This means from Vyasa's observation to Oak's date of Mahabharata war, Saturn needs 2 full years to fill the gap. But in Nilesh Oak's 'scientific' research this is possible!

(3) Experiment number 12: “Mercury travelling through all nakshatras”.⁶⁹⁵ (Mahabharata reference No 15 in his book)

The verse says,

triṣu pūrveṣu sarveṣu nakṣatreṣu viśāṃ pate

budhaḥ saṃpatate 'bhikṣṇaṃ janayan sumahad bhayam⁶⁹⁶

Nilesh Oak interprets this verse as a “trivially true observation” of Mercury travelling through all the nakshatras over a period of one year and therefore “no verification is

⁶⁹⁵“When did the Mahabharata war happen?” Page 79.

⁶⁹⁶Mahabharata:6-3-27

required.” So “The observation certainly corroborates my conjecture for the time interval over which astronomy observations were made during and after the Mahabharata War,” says Nilesh Oak.

The issues are:

Why should Vyasa single out Mercury as travelling through all stars when all planets travel through all nakshatras?

There is another expression “budhaḥ sampatate” describing a collision or intersection at the time of Mahabharata war. Without deducing what ‘sampatate’ means how can a ‘scientific researcher’ conduct his experiment and claim success?

The success claimed by Oak is such that this verse corroborates his conjecture that the astronomy observations given by Vyasa were actually made during, before and after the war. This is based on the above verse on Mercury of travelling through all nakshatras. If this can be claimed as corroboration, anyone can quote a year XXXX and say the planets travelled through all the nakshatras and therefore his / her conjecture is corroborated well!

This corroboration is made in violation of the obvious fact that Vyasa made this observation only before the first day of the war and certainly not after the war. Perhaps Nilesh Oak thinks his readers are dullards.

(4) Experiment numbered 13: Vakri’ motion of Mars.⁶⁹⁷ (Mahabharata reference No: 11, 13, 14 in his book)

In the previous instances quoted on the manipulations done by Nilesh Oak to prove his date, we faulted him for neglecting to define the terms in the verses. Here in this experiment he attempts to define the term ‘Vakri’ in the verses on Mars. It was well established earlier how Nilesh Oak demonstrated his utter lack of understanding of ‘Vakri’. In this experiment he describes how he derived the meaning of the term Vakri through DVA – Direct Visual Astronomy of the Simulator.

Nilesh Oak hopes to clinch something big in his discovery of the meaning of Vakri, comparable with Kepler. He says,⁶⁹⁸

“There is indeed something intriguing about Mars. Small discrepancy (between prediction and actual observation) in the measurement of Mars led Kepler to his marvellous theory of

⁶⁹⁷“When did the Mahabharata war happen?” Page 80 & 81.

⁶⁹⁸Ibid. Page 81.

elliptical orbits of planets. Intriguing descriptions of Mars in the Mahabharata text and my explanation provide high degree of corroboration to the proposed year of 5561 B.C.”

Oak has indeed made a break-through invention of Mars spending nearly 6 months in retrogression in Chitra and Swati before it turned forward.⁶⁹⁹ This is against the current scientific knowledge of Mars in retrogression that is possible for only 80 days at a stretch. All glory to Voyager simulator that enabled him to see this through DVA.

Nilesh Oak can notify the developers of Voyager Simulator of this discovery to take his name forward for recognition.

Oak can also notify them of his innovative ways of deriving meaning for a Sanskrit word like ‘vakri’ and the English word ‘retrogression’ by means of DVA so that they can use his name and innovation as publicity material to promote their product.

But Nilesh Oak must be careful not to take his discovery and innovation to the notice of an astronomer to avoid getting his book tossed into a dustbin. No astronomer would accept his explanation without first establishing them conceptually and mathematically.

Sadly Nilesh Oak’s book is a series of ideas never established conceptually or mathematically but ‘seen’ and ‘proven’ in the DVA of the Voyager Simulator.

(5) Experiment No 14: “Jupiter going vakri near Shravana”⁷⁰⁰

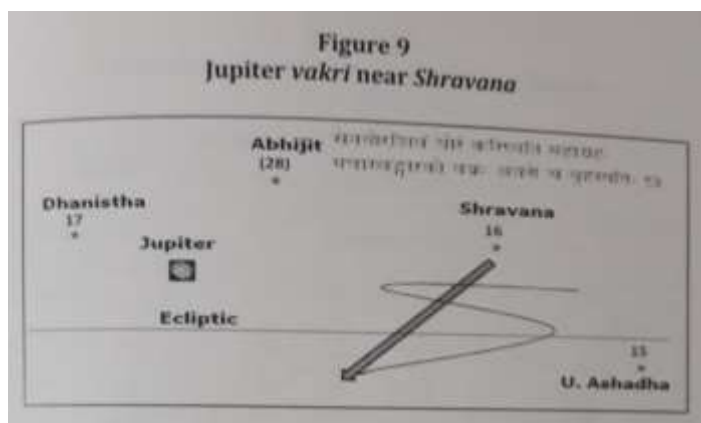
(Mahabharata reference no 11 in his book)

Once having convinced himself about the meaning of vakri in Mahabharata text through his own derivation using the simulator, Nilesh Oak confidently describes the verse “maghāsv aṅgārako vakraḥ śravaṇe ca bṛhaspatiḥ” as referring to the vakri motion of Mars and Jupiter. Having ‘established’ the vakri motion of Mars in the previous experiment, he is concentrating on Jupiter’s vakri motion in this experiment. He says, “*DVA simulation of Jupiter corroborated ‘vakri’ motion of Jupiter as it travelled obliquely across the ecliptic near Shravana.*”

Crossing the ecliptic obliquely is Oak’s definition for ‘vakri’ motion. He looked for such motion in the simulator and created Figure 9 and Table 7 to give additional details to prove this.

⁶⁹⁹Ibid. Page 81

⁷⁰⁰ Ibid. Page 82



This figure is fine but where is Sun's position in this figure? Any vakri motion is caused when the superior planet is away from the Sun. For Jupiter, vakri motion starts when it reaches 245° from the Sun and ends that motion on reaching 115° from the Sun.

Computing the distance on the first day of the War, the gap between Jupiter in Shravana (according to Nilesch Oak) and Sun in Jyeshtha (assuming it to be in the last degree of Jyeshtha) was anywhere between 41° to 54° only and not sufficient enough to make Jupiter appear to be in vakri for an observer on the earth.

This means that Jupiter was not in Vakri motion at Shravana when the Sun was in Jyeshtha in the 1st day of the War in Nilesch Oak's timeline.

If Vyasa had said that Jupiter was in vakri at Shravana on that day, then it means that Nilesch Oak's date of Mahabharata is wrong.

Any astronomy simulator would show vakri movement of a planet. But in the absence of that for Jupiter for his date, Nilesch Oak had simply manipulated the entire concept of vakri which I exposed in the 4th chapter of this book.

The best way to falsify Oak's definition of vakri (that it refers to crossing the ecliptic) is to present the declination graph of planets. The following figure is the declination graph for April 2019⁷⁰¹ that shows two planets Mercury and Venus crossing the ecliptic on 21st and 23rd April respectively from south to north. But no vakri or retrograde motion is detected along with or after this crossing.

⁷⁰¹Source: <https://cafeastrology.com/declinations.html>



Common sense dictates that a researcher cross-checks these positions with testable periods as done above. This is too much for the asking as far as Nilesh Nilkanth Oak is concerned. He lives in his own world of ‘scientific research’.

(6) Experiment No 15: “Venus near Purva Bhadrapada.”⁷⁰² (Mahabharata reference No 18 in his book)

The next experiment numbered 15 can be clubbed with Experiment No 21 as they are about the location of Venus on the 1st and 18th day of the war respectively. The two locations deduced by Nilesh Oak using DVA and Voyager simulation stands out as a classic example of misuse and manipulation of the so-called Falsification theory of Popper besides getting stamped as the “**Mother of all Manipulations**”

Let us see the first location given in experiment 15. In this, Oak attempts to corroborate the location of Venus near Purva Bhadrapada in Voyager Simulator. The following verse of Mahabharata is the basis for this derivation.⁷⁰³

śukraḥ proṣṭhapade pūrve samāruhya viśāṃ pate
uttare tu parikramya sahitaḥ pratyudīkṣate

⁷⁰²“When did the Mahabharata war happen?” Page 82.

⁷⁰³Mahabharata: 6-3-14 <http://www.sacred-texts.com/hin/mbs/mbs06003.htm>

Nilesh Oak declares, “*There was no need to guess through, not when you have DVA and Voyager 4.5.*”

He simulated the journey of Venus beginning the 1st of the War and found that Venus turned north and did a circular journey (parikrama) around Neptune near Purva Bhadrapada – Neptune, the planet never even once recognised in any literature of India.

“*The simulator corroborated Venus turning north as if to do parikrama (around Neptune) near Purva Bhadrapada.*” Remember this is on the 1st day of the War noticed in the simulator.

In **21st experiment** Nilesh Oak wants to corroborate another verse (Reference no 17 in his book) that says that Mars, Venus and Mercury appeared behind the Pandavas on the 18th day.⁷⁰⁴ Oak finds that “*Voyager simulation confirmed positions of these planets in the western part of the sky after sunset.*”

From the simulator Oak gives the separation angle of Venus from the Sun as 43.1°.

Organising the two positions at 1st and 18th day of the War:

1st day position of Venus = Venus was near Purva Bhadrapada. Purva Bhadrapada starts from 20 degrees of Aquarius. Sun was in Jyeshtha in Scorpio on the first day of the War. Assuming that the Sun was at the last degree of Jyeshtha on the 1st day of the War, Venus at Purva Bhadrapada can be located at more than 81° from the Sun. This is an **IMPOSSIBLE** location because Venus cannot be sighted 47 degrees away from the Sun – forward or backward. Venus is an inner planet and can be seen only within 3 signs (at the most) of the sun. When the Sun is in Scorpio, Venus cannot be in Pisces or even Aquarius where Purva Bhadrapada is located.

Only a person who does not have any basic knowledge about planetary position from the sun in geo-centric view will be able to go ahead ‘deducing’ the location as Oak has done.

18th day position of Venus = Venus was sighted in the western sky after sunset at a distance of 43.1° from the Sun. This was also “confirmed” from Voyager simulator.

The issue is within a matter of 18 days Venus has travelled backwards from Purva Bhadrapada at more than 81° away from the sun to its east to 43.1° to the west of the Sun. This means covering a distance of 124.1° in 18 days!!! This is also an **IMPOSSIBLE** situation.

⁷⁰⁴“When did the Mahabharata war happen?” Page 86.

Who has gone wrong?

Was Vyasa wrong?

Was Voyager wrong?

Was Nilesch Oak wrong?

Vyasa could not have been wrong. He had given an observation using the tradition and terminology of his times and may not have meant that Venus was near Purva Bhadrapada on the 1st day of the War (also explained in the 12th chapter of this book).

But Nilesch Oak went ahead with that and even found it in the simulation! How could the simulator give a wrong reading?

There can be only one deduction from this: Nilesch Oak had seen Venus in the simulator on some day when it was actually transiting that location but linked it with the 1st day of the war! All for corroborating his date of Mahabharata War!

The same simulator gives the location of Venus on the 18th day at a distance reasonably within limits. But between the two dates, the ‘corroboration’ done by Oak to align the position of Venus with his date of Mahabharata smacks of all the following:

Hypocrisy

Lack of integrity in research

Lack of astronomy knowledge

Lack of understanding of how to use the simulator

Lack of knowledge that scientific research calls for exactness and not approximations and manipulations.

All these put together is the negative outcome of what Popper’s theory of Falsificationist criteria does to scientific spirit. Nilesch Nilkanth Oak enters the pages of history as a classic example of misuse of Falsificationist methodology.

(7) Experiment No 16: “Tivra or Tikshna, Planet or nakshatra near Krittika” ⁷⁰⁵ (Mahabharata reference No 21 in his book)

The reference verse is from Bhishma parva.

kr̥ttikāsu grahas tīvro nakṣatre prathame jvalan

vapūṃṣy apaharan bhāsā dhūmaketur iva sthitah⁷⁰⁶

⁷⁰⁵“When did the Mahabharata war happen?” Page 83.

Nilesh Oak doesn't know what Tivro nakshatra means in this verse. He doesn't care to search for the true meaning from traditional texts. His *"task was then simply to re-confirm what Vartak has already figured out. Pluto is seen between Rohini and Kritika, rather closer to Rohini on the first day of War. This is sufficient corroboration of this Mahabharata observation."*

The verse refers to Tivro Nakshatra, but Oak identifies it as Pluto! It is because he is only re-confirming Vartak's observation that Nakshatra could mean 'extremely slow moving planet' (Pluto). Pluto is not even a planet in current standards, but Oak thinks Vyasa had meant that in his observation! *"This observation demands telescopic ability, i.e. access to such instruments in Mahabharata times. This ability is also required to explain few other Mahabharata observations."* By saying this Oak keeps the door open for further **manipulation – with the sole aim of corroborating his date of Mahabharata War.**

(8) Experiment number 17: "The Sun and the Moon together afflicting Rohini"⁷⁰⁷ (Mahabharata reference no 26 and also 8, 9, 12 in his book)

In this experiment Nilesh Oak claims to explain 4 Mahabharata references (numbered 8, 9, 12, 26) – all pointing to a term Pidayate. This term means afflicting – a case of one planet afflicting another or a planet afflicting a star. This term is used in astrology but scientific minded Oak does not accept astrology as an empirical science. With the simulator at hand he 'discovers' the meaning of pidayate as a situation of one planet rising and another setting simultaneously by which the rays of one afflicts the other. He uses this conjecture to describe the Sun and the Moon on the Amawasya day setting on the west while Rohini was rising on the east.

He extends this rationale to three other Mahabharata references too (8, 9 and 12) and claims that his conjecture allowed him to explain those references too. The fact is he did not explain those verses with the meaning he deduced from the simulator. Nor do those verses give any description of the entities mentioned in those verses to be in opposite ends (180°) as with Sun and Moon opposite to Rohini.

How then could one interpret that those verses also refer to the rays of one fall on the other?

Does it sound logical that only the entities at two ends of the sky afflict the other (or each other)?

Why not the planets at any location send their rays on others in any other part of the sky?

⁷⁰⁶ Mahabharata: 6-3-26 <http://www.sacred-texts.com/hin/mbs/mbs06003.htm>

⁷⁰⁷ "When did the Mahabharata war happen?" Page 83 & 84

Should a scientific minded Oak propose this kind of theory of rays of one afflicting the other for a word “Pidayate”?

By offering such an explanation, is he not complying with astrology?

(9) Experiment No 18: “Jupiter, similar to the Sun and the Moon, afflicting Rohini after the sunset on the 17th day of War”.⁷⁰⁸ (Mahabharata reference No 12 in his book)

This **again** is a reference to ‘Pidayate’. This experiment is aimed at explaining the verse “Brhaspati rohinim samprapidaya”.⁷⁰⁹ The verse refers to Jupiter afflicting Rohini. The verse is being told on the 17th day of the war. The simulator based meaning of ‘Pidayate’ deduced by Oak is such that the one afflicting must be on one side of the horizon while the afflicted one must be in the opposite horizon. That is, if one is in the western horizon, the other must be in the eastern horizon. They must be at a distance of 180°.

The previous experiment showed that Rohini was in the eastern horizon when it was afflicted by the Sun and the Moon that were setting in the western horizon. But on the 17th day, Jupiter comes in the picture as one afflicting Rohini. Oak conjectures that Jupiter must be in the western horizon to make this affliction on Rohini. The Voyager simulator confirms the presence of Jupiter in the western sky in the same position occupied by the Sun and the Moon in the 1st day. So the ‘pidayate’ happens on Rohini.

Now the questions in our mind are

We found the location of Jupiter in experiment numbered 14 at Shravana on the 1st day of the war. This was to the east of the Sun at a distance of 41° to 54°. In 17 days, how far Jupiter had moved to be at the same location of Sun on the 1st day?

Each day the point of horizon rises early by 1° approximately (for 360° to be covered in a year) and so in 17 days the part of the sky where Jupiter is located rises 17° earlier. In the same period the Sun had progressed by 17° resulting in reduction in the gap between the Sun and Jupiter. On the 17th day Jupiter would be seen at a distance of 24° to 37° from the Sun.

This is not the exact location of the Sun on the 1st day of the war.

From Jupiter at 24° to 37° range from the Sun, Rohini will be anywhere between 107° to 130° distance from Jupiter. This is not exact 180° gap or anywhere close to it to enable Jupiter to afflict Rohini by its rays by “pidayate.”

⁷⁰⁸“When did the Mahabharata war happen?” Page 84.

⁷⁰⁹Ibid. Reference no 12.

But Oak claims that the simulator shows Jupiter in the western horizon. This is possible at more than 2 hours after sunset and definitely not at the time of sun set when the Sun was afflicting Rohini on the 1st day of the War.

At a distance of minimum 50° short of 180° Oak uses the description of Pidayate which he originally theorised for 180° distance. He wants us to accept such descriptions as scientific! If affliction is what happens at 180°, he cannot claim it to happen at 130°. If it happens so, then his explanation for pidayate is not correct.

(10) Experiment No 19: “Saturn afflicts Rohini”.⁷¹⁰ (Mahabharata reference No 8, 9 in his book)

Affliction is “Pīdana” and so there is no problem in explaining away this reference in the same lines that Nilesh Oak explained for the Sun and the moon afflicting Rohini, and Jupiter afflicting Rohini. Oak does concede that having explained the observation of affliction of Rohini in previous experiments, “it is easy to understand Mahabharata observation(s) of Saturn.”

Rohini was in the western horizon and “Saturn being the only other planet in the eastern part of the sky”, “this observation is then described as Saturn afflicting Rohini,” so concludes Nilesh Oak.⁷¹¹ However he is tempted to use other terms known to him such “Rohini Shakat Bheda”. The underlying feature of his research is such that one must get together the terms known to one and say that the observations are corroborated.

(11) Experiment No 20: “Unusual (Tiryak) rising of Mercury on the 17th day of the War (after the sunset)⁷¹² (Mahabharata reference No 16 in his book)

Nilesh Oak has picked out a verse expressed at the fall of Karna that is analogous to mourning the death of Karna. In a bid to express that all animate and inanimate, terrestrial and celestial beings were sad, the appearance of Mercury was also quoted in that context. The rivers had stood still. The sun had become pale and Mercury appeared to move in ‘tiryak’ way! Here Tiryak means slanting or horizontal and not unusual that Oak thinks. As if to bow before the fallen Karna, Mercury had moved obliquely or in slanting angle. This is what the verse says.

⁷¹⁰“When did the Mahabharata war happen?” Page 85.

⁷¹¹Ibid. Page 85

⁷¹²Ibid, Page 85

This verse does not qualify to be a testable astronomy observation, for Mercury is always seen close to the sun within 28 degrees on either side of the sun for the observer on earth. Take any year in the simulator; one can spot Mercury crossing the sun from one side or another in horizontal or slanting angle or just moving in the sky to the east or west of the Sun. This is not unique to Nilesh Oak's date of Mahabharata or any other date. Just to count his numbers corroborated, Nilesh Oak has taken this regular feature of Mercury.

(12) Experiment No 21: "Mars, Venus & Mercury in the western sky after sunset, 18th day of the war"⁷¹³ (Mahabharata reference No 17 in his book)

After locating Venus in Purva Bhadrapada (experiment 15) Nilesh Oak is able to see it 124 degrees backward within 18 days – an impossible situation. Mars located closely behind the Sun in this reference was aligned with Abhijit on the first day of the war according to his blog-entry. Abhijit is at Capricorn but in this experiment he sees Mars after sunset on the 18th day of the war in the western sky at 46.6° from the sun. This super-fast movement by these planets have been objectively tested, claims Nilesh Oak, the master manipulator.

From his blog-post dated 20th April 2019⁷¹⁴

(g) Mars afflicting nakshatra Swati or becoming steady while moving in abnormal direction between nakshatras Chitra/Swati or aligning itself along nakshatra Brahmarashi (Abhijit) on the first day of Mahabharata war,

(13) Experiment No 22: "Seven planets seen near the Sun"⁷¹⁵ (Mahabharata reference No 24 in his book)

This phoney nature of the corroboration done by Nilesh Oak was already explained in the 4th chapter. To re-cap it, the verse doesn't say that the planets were near. Nilesh Oak 'corroborates' seven planets by including Neptune and Uranus. I have established the import of this verse in the 12th chapter.

⁷¹³Ibid, Page 86

⁷¹⁴"Balancing Reciprocity"

<https://nileshoak.wordpress.com/2019/04/20/%e0%a4%b8%e0%a4%be%e0%a4%a7%e0%a5%8d%e0%a4%af-%e0%a4%b8%e0%a4%ae-balancing-the-reciprocity/>

⁷¹⁵"When Did The Mahabharata War Happen?" Page 87

(14) Experiment No 23: “Seven planets attacking the moon”⁷¹⁶

(Mahabharata reference No 23 in his book.

This is an analogy to “describe the war scene of seven Kaurava brothers attacking Bhima”, admits Oak. Only Nilesh Oak has the temerity to test analogies in astronomy simulator and claim that he has successfully corroborated astronomy references of Mahabharata.

(15) Experiment No 24: “Seven planets going away from the Sun.”⁷¹⁷

(Mahabharata reference No 25 in his book)

Already I exposed the bogus nature of the explanation by Nilesh Oak for this verse in the 4th chapter. I am reproducing here to remind the readers the nature of his “corroboration”.

“Without saying whether his simulator showed them in retrograde motion,^{718, 719} Nilesh Oak simply states that the “*Voyager simulation showed that all planets were going away from (towards east) the Sun, with the exception of Pluto. Pluto was retrograde.*” This means except Pluto none of the other planets (he mentions only five apart from Pluto – viz. Neptune, Mars, Venus, Mercury and Jupiter) were retrograde at that time. But Voyager shows them moving towards east! And his planetary list of the seven planets includes Mars which he locates at 46.6° behind the sun⁷²⁰ on the very next day– a distance at which Mars can never go retrograde. I leave it to the reader to judge the merit of Nilesh Oak’s claim of these non-retrograde planets (except Pluto which he treats as stationary due to its slow movement) moving towards east and the inclusion of two outer most planets in this list.”

(16) Experiment No 25: “Brightly shining comets (!) in the sky”

Nothing is corroborated here as his Simulator does not show any comets in his time line. So he rejects the comet theories of others and repeats the same manipulations of planetary positions that I exposed above. That a comet or asteroid hit the earth at that time is beyond his power of comprehension.

(17) Experiment No 26: “Shweta (near Chitra) & Shyama (near Jyeshtha)”

(Mahabharata reference No 19, 20)

Mere speculations and he himself does not claim any corroboration by stating that he had ‘presented multiple scenarios to emphasize the point that unless we have additional

⁷¹⁶Ibid.

⁷¹⁷ Ibid.

⁷¹⁸Ibid. Page 88

⁷¹⁹Ibid. Page 169

⁷²⁰Ibid. Page 86

information, we should consider the identification (and consequently corroboration) of the planets described in these Mahabharata observations as unresolved.”⁷²¹

However the names of these planets were resolved by me in the 4th chapter.

(18) Experiment No 27: “Comet attacking Pushya” (Mahabharata references No 21, 22)

Nilesh Oak conjectures that this was Haley’s comet. It was not in the vicinity of visibility. However this was “corroborated” by him on the basis of the assumption that Mahabharata people had the “ability to see objects far smaller and distant in the sky, the ability as such already assumed during the discussion of Uranus, Neptune and Pluto.”⁷²²

So far we have seen all the ‘Corroborations’ that Nilesh Oak has given to ‘establish’ that the planets were aligned for his date of Mahabharata war. These are boasted off as 300+ references corroborated by him. In reality none of what he had ‘corroborated’ stand scrutiny and can at best be branded as manipulations.

Similar trend is seen in the 8th chapter on corroborating the astronomy events on the first day of the war in his timeline. As there is no substance in any of the features he explained, I am producing them in a table with a remark alongside. Nilesh Oak believes that there was a solar eclipse on the 1st day of the war and hence collected all possible verses to corroborate his timeline. He completely disregards the late moon-rise on the 14th day of the war which pre-supposes that the war started in waxing phase and waning phase was running for most of the days of the war.

Ex No	Mahabharata references in his book	Feature	Nilesh Oak	Remarks
28	9,27,28,29,64	Lunar eclipses	Solar eclipse on 1 st day of war & Lunar eclipse on the 15 th day of war	Wrong. War started in waxing phase. Late Moonrise on 14 th day of war indicates

⁷²¹Ibid. Page 93

⁷²²Ibid. Page 95

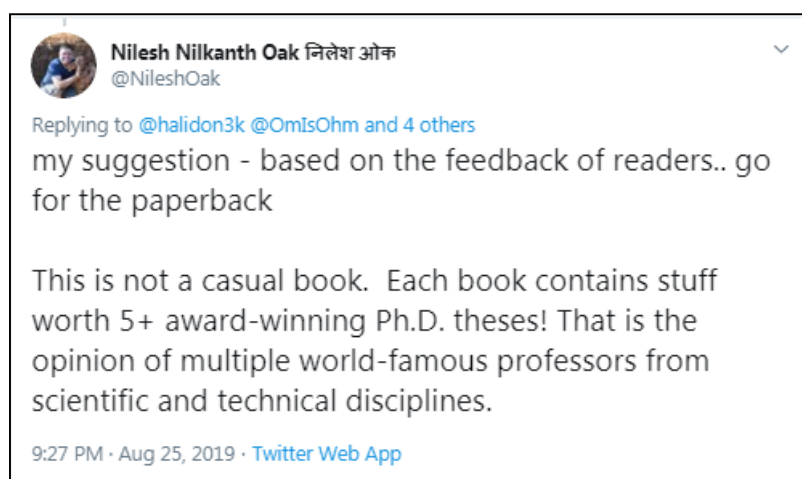
				Amawasya nearing.
29	29	Two eclipses separated by 13 days	Two eclipses separated by 23 days	Wrong.
30	34,35	Solar eclipse on the 1 st day of war	Solar eclipse on the 1 st day of war	Wrong.
31	34	Sun appeared in split parts.	Proposes eclipse	Wrong.
32	34	Flames of the sun visible.	Proposes eclipse	Wrong.
33	35	Morning sun splendour lost.	Proposes eclipse	Wrong.
34	36	Disappearance of the sun in the middle of battle.	Proposes eclipse	Wrong.
35	38	Sun and the moon seen on Amawasya	Proposes Amawasya	Analogy for Satyaki and Abhimanyu joining together to fight.
36	40,41,43,47, 49,37,	Moon references in first 11 days of war	Proposes waxing phase	All are analogies.
	37, 40, 42, 45,	Warriors	Proof for Amawasya	Can happen on

	46	fighting late at night, exhausted	on 1 st day.	any day of the war
37	48	Moon rising with pointed heads down	Supports Amawasya on 1 st day	Lunar eclipse.
38	51, 52, 53, 55,56, 60,61,62,63,65, 66,71, 72,67,68, 69, 70	Moon appears like Full Moon last 7 days of war	Supports Amawasya on 1 st day	All are analogies. Oak admits “rich in full moon analogies”
39	50	Full Moon near Krittika	Full Moon on 12 th day	Analogy of Bhagadatta described as similar to full moon near Krittika
40	57	Moon between two Vishakhas.	16 th day of war. Moon in Punarvasu. But proof for Full Moon, thereby corroborating Amawasya on the 1 st day	Analogy of how Pandyaraj’s head was split by Aswatthama’s weapon as though moon was split between 2 Vishakhas
41	58	Sons of Draupadi protecting Dhrishtadyumna	5 stars protected the moon (simulation)	Analogy
42	59	2 Panchal	2 Punarvasus behind	Analogy

		warriors behind Yudhishtir	Moon	
43	64	Yudhishtir free from misery	Moon free from Rahu	Analogy
44	-	Insertion of additional month	To complete Balarama's Tirtha Yatra in simulator	Ad hoc, arbitrary, manipulative
45	73	Meaning of Yojayet	Manipulates as 'Yojante'	Ad hoc, arbitrary, manipulative
46	73	Jyeshtha Amawasya	Suits his modified timeline	Amawasya in Jyeshtha occurs every year
47	74	Krishna leaving on Revati nakshatra	Interprets Maitri as Anuradha	Maitri here refers to Muhurta
48	75	Balarama left Pandava camp on Anuradha	Nothing corroborated	-
49	76	Secret meeting of Yudhishtir near Full Moon day	Proposes Full Moon nearing	Analogy
50	77, 78, 79	Both armies leaving for Kurushetra on Pushya day	Fixes the date in simulator	Every month Pushya day comes.
51	80	Both armies arrive at Kurushetra on	Fixes the date in simulator	Every month Magha day

		Magha day		comes.
52	81,82, 83	Krishna Nirvana	Cites 2 eclipses within 13 days	Mahabharata tells about only Amawasya coming on the 13 th day

The other experiments such as those pertaining to Abhijit and conflicting observations in Mahabharata were already discussed in the previous chapters. In all, only around 100 Mahabharata references are ‘corroborated’, nay ‘manipulated’ by Nilesch Nilkanth Oak. None of the so-called corroborations are found valid. But what has Nilesch Oak got to say? His recent tweet says that his book contains stuff worth 5+ award winning Ph.D theses!



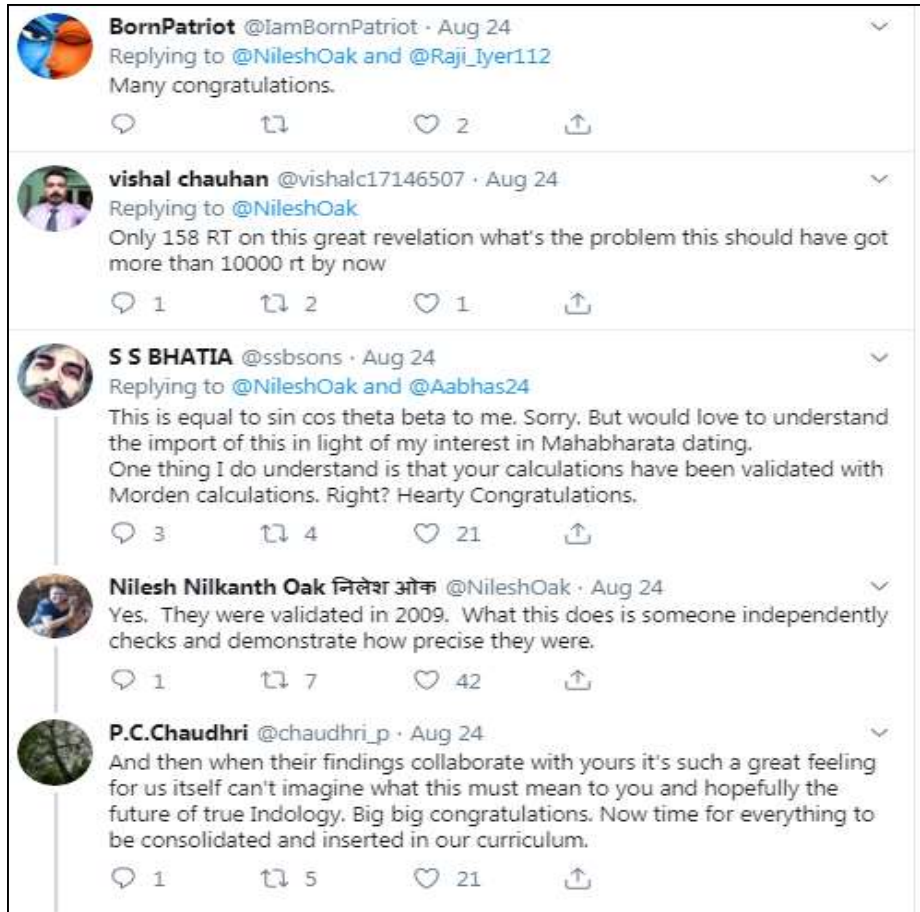
This ‘revolutionary’ discoverer waiting for recognition as a Kepler or Newton, when finding nothing of that kind coming along knows how to ‘manipulate’ – a trait that he has well demonstrated in his book. The **Master Manipulator** was seen at his Best Form when he tweeted about “Hot from the Press” of SC deciding to test his results on AV observation, and scores of people congratulating him thinking that the Supreme Court of India had sought to validate his research!



In reality ‘SC’ turned out to be an abbreviation of a person who had commented in his blog.⁷²³

He deliberately created hype by this tweet and had no shame in accepting the accolades pouring on him from unsuspecting readers. For once he revealed in a reply that SC was the abbreviation of a person, but that was lost in the thread that others did not expand and read. The result was excitement over ‘SC’ decision to test his A-V observation. One of the readers even wondered why there aren’t more than 10,000 re-tweets for this revelation!!

⁷²³ <https://nileschoak.wordpress.com/2014/02/03/arundhati-vasistha-av-observation-of-mahabharata/#comment-3539>



A-V observation or the so-called Epoch of Arundhati being central to both the date of Mahabharata and Ramayana deduced by Nilesh Nilkanth Oak, he is found to be rigourously promoting his theme hoping for claim and acclaim as a Newton or Galileo or Kepler. At best these tricks can help him promote the sales of his books. But this theme being a high risk one, a rebuttal of it destroys Oak's date of Mahabharata and also Ramayana. What he characterised as a Mystery in his book on dating Mahabharata had turned out to be a myth!

We are in an age when people easily fall prey to deceitful and manipulative works. This book is meant for them. People must be on guard against attempts to distort established traditions in the name of scientific research. Arundhati's continuing relevance as an icon of pativrata must stir-up the Dharmic conscience in us in the current context. People of this great country having a rich tradition must seek and also be fed with right knowledge. Let them move from untruth to truth, from darkness to Light.

APPENDIX II

Mathematical calculation of relative rise and set time of stars with particular reference to Alcor (Arundhati) and Mizar (Vasishtha) in the period of Nilesh Oak's 'Epoch of Arundhati'

By

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Calculation of the Relative Rise and Set Times of Stars

The position of stars in the sky are typically defined in two reference frames – the Earth Centered Inertial (ECI) and the Local Horizon (LH) frame, as illustrated in Figure 1.

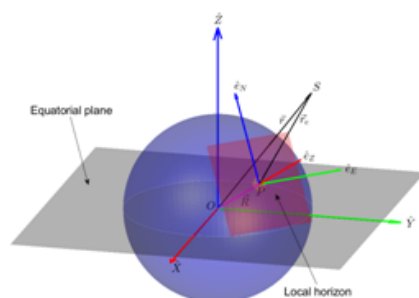


Figure 1: Illustration of the Earth Centered Inertial (ECI) and the Local Horizon (LH) frame.

The ECI frame is defined by the unit vectors \hat{X} , \hat{Y} and \hat{Z} , wherein \hat{X} and \hat{Y} lie on the equatorial plane. The definition of \hat{X} varies over time as the equatorial plane keeps changing as the Earth's rotation axis precesses and nutates. Presently, it points towards the first point of Aries. Nevertheless, it always lies on the equatorial plane, and the right ascension of stars is defined based on the definition of \hat{X} at a given epoch. Moreover, \hat{X} and \hat{Y} are perpendicular to each other, and \hat{Z} passes through the Earth's geographical North pole, so that $\hat{X} \times \hat{Y} = \hat{Z}$.

The LH frame is defined by a plane that is tangential to the Earth at the observer's location P . The unit vectors defining this frame are \hat{e}_E pointing East, \hat{e}_N pointing towards the geographical North pole, and \hat{e}_Z pointing towards the sky directly above the observer at P , perpendicular to the tangential plane, which also represents the local horizon plane.

The transformation from the ECI frame to the LH frame is defined by a series of rotations. Typically, direction cosine matrices are leveraged to define the transformation. However, the following derivation avoids the use of this terminology so that it can reach to a broader audience. Nevertheless, without diving into the details, the derivation essentially results in a matrix called the direction cosine matrix, which relates the ECI frame to the LH frame.

The first rotation, as illustrated in Figure 2, is about positive \hat{Z} by an angle $\omega(t - t_0) + \theta_0$, resulting in a new frame defined by the unit vectors \hat{X}_G passing through the prime meridian on the Earth's equator, \hat{Y}_G passing through the 90 deg East longitude and the Earth's equator, and \hat{Z}_G , passing through the Earth's geographical North pole.

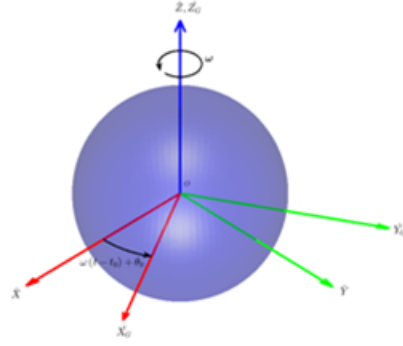


Figure 2: Transformation from ECI to Earth Centered Earth Fixed (ECEF) frame.

This frame is called the Earth Centered Earth Fixed (ECEF) frame because it is fixed with respect to any observer on Earth. Consequently, this frame rotates with the Earth at an angular velocity $\omega\hat{Z}$. Therefore, if \hat{X}_G makes an angle θ_0 with respect to \hat{X} at time $t = t_0$, it makes an angle $\omega(t - t_0) + \theta_0$ at any other time t . The relationship between ECI and ECEF frame is:

	$\begin{aligned}\hat{X}_G &= \cos(\omega(t - t_0) + \theta_0) \hat{X} + \sin(\omega(t - t_0) + \theta_0) \hat{Y} \\ \hat{Y}_G &= -\sin(\omega(t - t_0) + \theta_0) \hat{X} + \cos(\omega(t - t_0) + \theta_0) \hat{Y} \\ \hat{Z}_G &= \hat{Z}\end{aligned}$	(1)
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Therefore:

	$\begin{pmatrix} \hat{X}_G \\ \hat{Y}_G \\ \hat{Z}_G \end{pmatrix} = \begin{pmatrix} \cos(\omega(t - t_0) + \theta_0) & \sin(\omega(t - t_0) + \theta_0) & 0 \\ -\sin(\omega(t - t_0) + \theta_0) & \cos(\omega(t - t_0) + \theta_0) & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \hat{X} \\ \hat{Y} \\ \hat{Z} \end{pmatrix}$	(2)
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Consequently, the relationship between the ECEF frame and the $\hat{X}'_G - \hat{Y}'_G - \hat{Z}'_G$ frame is as follows:

$\begin{aligned}\hat{X}'_G &= \cos \phi \hat{X}_G + \sin \phi \hat{Y}_G \\ \hat{Y}'_G &= -\sin \phi \hat{X}_G + \cos \phi \hat{Y}_G \\ \hat{Z}'_G &= \hat{Z}_G\end{aligned}$	(3)
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Therefore:

$\begin{pmatrix} \hat{X}'_G \\ \hat{Y}'_G \\ \hat{Z}'_G \end{pmatrix} = \begin{pmatrix} \cos \phi & \sin \phi & 0 \\ -\sin \phi & \cos \phi & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \hat{X}_G \\ \hat{Y}_G \\ \hat{Z}_G \end{pmatrix}$ $= \begin{pmatrix} \cos \phi & \sin \phi & 0 \\ -\sin \phi & \cos \phi & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \cos(\omega(t-t_0) + \theta_0) & \sin(\omega(t-t_0) + \theta_0) & 0 \\ -\sin(\omega(t-t_0) + \theta_0) & \cos(\omega(t-t_0) + \theta_0) & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \hat{X} \\ \hat{Y} \\ \hat{Z} \end{pmatrix}$	(4)
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Moreover, the relationship between $\hat{X}'_G - \hat{Y}'_G - \hat{Z}'_G$ frame and LH frame is:

$\begin{aligned}\hat{e}_Z &= \cos \lambda \hat{X}'_G + \sin \lambda \hat{Z}'_G \\ \hat{e}_E &= \hat{Y}'_G \\ \hat{e}_N &= -\sin \lambda \hat{X}'_G + \cos \lambda \hat{Z}'_G\end{aligned}$	(5)
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Therefore:

$\begin{pmatrix} \hat{e}_Z \\ \hat{e}_E \\ \hat{e}_N \end{pmatrix} = \begin{pmatrix} \cos \lambda & 0 & \sin \lambda \\ 0 & 1 & 0 \\ -\sin \lambda & 0 & \cos \lambda \end{pmatrix} \begin{pmatrix} \hat{X}'_G \\ \hat{Y}'_G \\ \hat{Z}'_G \end{pmatrix}$ $= \begin{pmatrix} \cos \lambda & 0 & \sin \lambda \\ 0 & 1 & 0 \\ -\sin \lambda & 0 & \cos \lambda \end{pmatrix} \begin{pmatrix} \cos \phi & \sin \phi & 0 \\ -\sin \phi & \cos \phi & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \cos(\omega(t-t_0) + \theta_0) & \sin(\omega(t-t_0) + \theta_0) & 0 \\ -\sin(\omega(t-t_0) + \theta_0) & \cos(\omega(t-t_0) + \theta_0) & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \hat{X} \\ \hat{Y} \\ \hat{Z} \end{pmatrix}$ $= \begin{pmatrix} \cos \lambda \cos \phi & \cos \lambda \sin \phi & \sin \lambda \\ -\sin \phi & \cos \phi & 0 \\ -\sin \lambda \cos \phi & -\sin \lambda \sin \phi & \cos \lambda \end{pmatrix} \begin{pmatrix} \cos(\omega(t-t_0) + \theta_0) & \sin(\omega(t-t_0) + \theta_0) & 0 \\ -\sin(\omega(t-t_0) + \theta_0) & \cos(\omega(t-t_0) + \theta_0) & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} \hat{X} \\ \hat{Y} \\ \hat{Z} \end{pmatrix}$ $= \begin{pmatrix} \cos \lambda \cos(\omega(t-t_0) + \theta_0 + \phi) & \cos \lambda \sin(\omega(t-t_0) + \theta_0 + \phi) & \sin \lambda \\ -\sin(\omega(t-t_0) + \theta_0 + \phi) & \cos(\omega(t-t_0) + \theta_0 + \phi) & 0 \\ -\sin \lambda \cos(\omega(t-t_0) + \theta_0 + \phi) & -\sin \lambda \sin(\omega(t-t_0) + \theta_0 + \phi) & \cos \lambda \end{pmatrix} \begin{pmatrix} \hat{X} \\ \hat{Y} \\ \hat{Z} \end{pmatrix}$	(6)
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Consequently:

$\begin{aligned}\hat{X} &= \cos \lambda \cos(\omega(t-t_0) + \theta_0 + \phi) \hat{e}_Z - \sin(\omega(t-t_0) + \theta_0 + \phi) \hat{e}_E \\ &\quad - \sin \lambda \cos(\omega(t-t_0) + \theta_0 + \phi) \hat{e}_N \\ \hat{Y} &= \cos \lambda \sin(\omega(t-t_0) + \theta_0 + \phi) \hat{e}_Z + \cos(\omega(t-t_0) + \theta_0 + \phi) \hat{e}_E \\ &\quad - \sin \lambda \sin(\omega(t-t_0) + \theta_0 + \phi) \hat{e}_N \\ \hat{Z} &= \sin \lambda \hat{e}_Z + \cos \lambda \hat{e}_N\end{aligned}$	(7)
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Going back to Figure 1, S represents the star of interest, whose position vector with respect to the origin O (center of the Earth) is \vec{r} , and with respect to the observer P on the surface of the Earth is \vec{r}_e . Moreover, the position vector of the observer P with respect to the origin O is \vec{R} . Therefore:

	$\vec{r} = \vec{R} + \vec{r}_e$	(8)
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The vector \vec{r} (position of the star with respect to the center of the Earth) is defined in the ECI frame by the angles right ascension (Ω) and declination (γ), as shown in Figure 4.

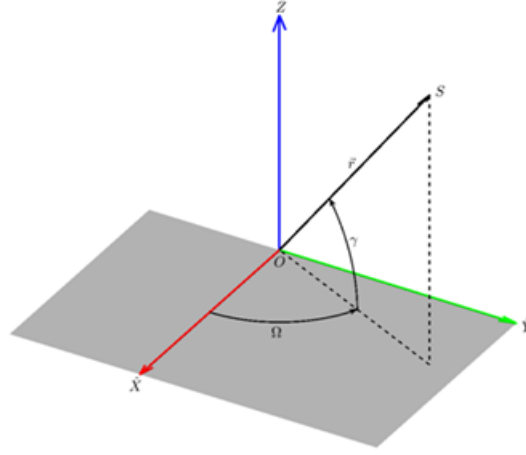


Figure 4: Illustration of position of star with respect to Earth's center in ECI frame.

From Figure 4:

	$\begin{aligned} \vec{r} &= r \cos \gamma \cos \Omega \hat{X} + r \cos \gamma \sin \Omega \hat{Y} + r \sin \gamma \hat{Z} \\ &= r(\cos \gamma \cos \Omega \cos \lambda \cos(\omega(t - t_0) + \theta_0 + \phi) \\ &\quad + \cos \gamma \sin \Omega \cos \lambda \sin(\omega(t - t_0) + \theta_0 + \phi) \\ &\quad + \sin \gamma \sin \lambda) \hat{e}_Z \\ &\quad + r(-\cos \gamma \cos \Omega \sin(\omega(t - t_0) + \theta_0 + \phi) \\ &\quad + \cos \gamma \sin \Omega \cos(\omega(t - t_0) + \theta_0 + \phi)) \hat{e}_E \\ &\quad + r(-\cos \gamma \cos \Omega \sin \lambda \cos(\omega(t - t_0) + \theta_0 + \phi) \\ &\quad - \cos \gamma \sin \Omega \sin \lambda \sin(\omega(t - t_0) + \theta_0 + \phi) \\ &\quad + \sin \gamma \cos \lambda) \hat{e}_N \end{aligned}$	(9)
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Moreover, the vector \vec{r}_e (position of the star with respect to the observer) is defined in the LH frame by the angles azimuth (ψ) and elevation (α), as shown in Figure 5.

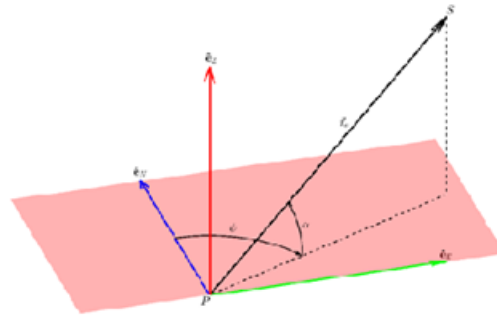


Figure 5: Position vector of star with respect to the observer in the LH frame.

When the elevation is greater than 0 deg, the star is above the horizon. From Figure 5:

$$\vec{r}_s = r_s \sin \alpha \hat{e}_Z + r_s \cos \alpha \sin \psi \hat{e}_E + r_s \cos \alpha \cos \psi \hat{e}_N \quad (10)$$

Recognizing that the star is very far away, the magnitude of \vec{R} is negligible when compared to that of \vec{r} and \vec{r}_s . Therefore:

$$\begin{aligned} \vec{r} &= \vec{R} + \vec{r}_s \approx \vec{r}_s \\ r &\approx r_s \end{aligned} \quad (11)$$

That is, Eq. 9 and 10 are essentially the same. Therefore:

$$\begin{aligned} \sin \alpha &= \cos \gamma \cos \Omega \cos \lambda \cos(\omega(t - t_0) + \theta_0 + \phi) \\ &\quad + \cos \gamma \sin \Omega \cos \lambda \sin(\omega(t - t_0) + \theta_0 + \phi) + \sin \gamma \sin \lambda \end{aligned} \quad (12)$$

$$\begin{aligned} \cos \alpha \sin \psi &= -\cos \gamma \cos \Omega \sin(\omega(t - t_0) + \theta_0 + \phi) \\ &\quad + \cos \gamma \sin \Omega \cos(\omega(t - t_0) + \theta_0 + \phi) \end{aligned} \quad (13)$$

$$\begin{aligned} \cos \alpha \cos \psi &= -\cos \gamma \cos \Omega \sin \lambda \cos(\omega(t - t_0) + \theta_0 + \phi) \\ &\quad - \cos \gamma \sin \Omega \sin \lambda \sin(\omega(t - t_0) + \theta_0 + \phi) + \sin \gamma \cos \lambda \end{aligned} \quad (14)$$

At the time of rising and setting, the star is at the horizon. Therefore, $\alpha = 0$ deg. Consequently, Eq. 12 becomes:

$$\begin{aligned} \cos \gamma \cos \Omega \cos \lambda \cos(\omega(t - t_0) + \theta_0 + \phi) \\ + \cos \gamma \sin \Omega \cos \lambda \sin(\omega(t - t_0) + \theta_0 + \phi) + \sin \gamma \sin \lambda = 0 \end{aligned} \quad (15)$$

Dividing Eq. 15 by $\cos \alpha \cos \lambda$:

$$\begin{aligned} \cos \Omega \cos(\omega(t - t_0) + \theta_0 + \phi) + \sin \Omega \sin(\omega(t - t_0) + \theta_0 + \phi) + \tan \gamma \tan \lambda \\ = 0 \\ \cos(\omega(t - t_0) + \theta_0 + \phi - \Omega) = -\tan \gamma \tan \lambda \\ \omega(t - t_0) + \theta_0 + \phi = \Omega \pm \cos^{-1}(-\tan \gamma \tan \lambda) \end{aligned} \quad (16)$$

The quantity $\omega(t - t_0) + \theta_0 + \phi$ represents the angle between $\hat{\lambda}$ and a vector originating from the Earth's center and passing through the equator and the longitude ϕ of the observer. Let this angle be θ , which is essentially an indirect representation of time. In general, a smaller θ represents an earlier time because the Earth has rotated less. Therefore, Eq. 16 becomes:

$$\theta = \Omega \pm \cos^{-1}(-\tan \gamma \tan \lambda) \quad (17)$$

Eq. 17 shows that there are two values of θ corresponding to $\alpha = 0$. One of them corresponds to rising time and the other one corresponds to setting time. To resolve this, the corresponding azimuth ψ is required to be determined. An azimuth between 0 deg and 180 deg represents East (rising), and a value between 180 deg and 360 deg represents West (setting). The azimuth corresponding to each θ calculated using Eq. 17 can be determined from Eq. 13 by setting $\alpha = 0$ deg, so that:

Or	$\psi = \sin^{-1}(-\cos \gamma \cos \Omega \sin \theta + \cos \gamma \sin \Omega \cos \theta)$ $\psi = \frac{\pi}{2} + \sin^{-1}(-\cos \gamma \cos \Omega \sin \theta + \cos \gamma \sin \Omega \cos \theta)$	(18)
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It can be seen that there are two solutions for a given θ . However, only one of them is the desired solution. To resolve this, ψ is also calculated from Eq. 14 by again setting $\alpha = 0$ deg so that:

Or	$\psi = \cos^{-1}(-\cos \gamma \cos \Omega \sin \lambda \cos \theta - \cos \gamma \sin \Omega \sin \lambda \sin \theta + \sin \gamma \cos \lambda)$ $\psi = -\cos^{-1}(-\cos \gamma \cos \Omega \sin \lambda \cos \theta - \cos \gamma \sin \Omega \sin \lambda \sin \theta + \sin \gamma \cos \lambda)$	(19)
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Only one solution will be common to both Eqs. 18 and 19, and this is the desired azimuth for a given θ .

It should be noted that Eq. 16 requires the magnitude of $\tan \gamma \tan \lambda$ to be less than or equal to 1, because otherwise, no real solution exists, and θ will be complex. Physically, this simply means that the star is circumpolar.

To conclude, if θ of a given star corresponding to the rising time is smaller than that of another, it means that the given star is rising first. Moreover, if θ corresponding to the given star's setting time is larger than the other, it means that it is setting second.

The main source of error in the calculation of θ during rising and setting of the star is the atmospheric refraction, which was not accounted for here. However, accounting for this merely results in a constant bias added to θ , and does not affect the order of rising and setting of the different stars, and the difference between their rising/setting times.

Example Calculation for 9000 BC at 29.1569 deg (0.5089 radians) Latitude

Alcor

$$\Omega = 22^{\text{h}} 32^{\text{m}} 33.47^{\text{s}} = 5.7691 \text{ radians (or } 5.7691 - 2\pi = -0.5141 \text{ radians)}$$

$$\gamma = 53^{\circ} 20' 55.5'' = 0.9311 \text{ radians}$$

$$\theta = -0.5141 \pm \cos^{-1}(-\tan(0.9311) \tan(0.5089)) = 1.9044, -2.9327 \text{ radians}$$

$$\psi =$$

$$\sin^{-1}(-\cos(0.9311) \cos(-0.5141) \sin(1.9044) + \cos(0.9311) \sin(-0.5141) \cos(1.9044)),$$

$$\frac{\pi}{2} + \sin^{-1}(-\cos(0.9311) \cos(-0.5141) \sin(1.9044) + \cos(0.9311) \sin(-0.5141) \cos(1.9044))$$

$$= -0.4060, 1.1648$$

$$\psi =$$

$$\pm \cos^{-1}(-\cos(0.9311) \cos(-0.5141) \sin(0.5089) \cos(1.9044) - \cos(0.9311) \sin(-0.5141) \sin \lambda(0.5089) \sin(1.9044) + \sin(0.9311) \cos(0.5089))$$

$$= 0.4060, -0.4060$$

It can be seen that $\psi = -0.4060$ radians (-23.2643 deg or 336.7357 deg) is the common solution. Since this corresponds to west, $\theta = 1.9044$ radians (109.1160 deg) corresponds to setting time. Therefore, the other θ (-2.9327 radians or -168.0307 deg) corresponds to the rising time.

Mizar

$$\Omega = 22^{\text{h}} 32^{\text{m}} 56.62^{\text{s}} = 5.7692 \text{ radians (or } 5.7692 - 2\pi = -0.5140 \text{ radians)}$$

$$\gamma = 53^{\circ} 08' 52.9'' = 0.9276 \text{ radians}$$

$$\theta = -0.5140 \pm \cos^{-1}(-\tan(0.9276) \tan(0.5089)) = 1.8963, -2.9244 \text{ radians}$$

$$\psi =$$

$$\sin^{-1}(-\cos(0.9276) \cos(-0.5140) \sin(1.8963) + \cos(0.9276) \sin(-0.5140) \cos(1.8963)),$$

$$\frac{\pi}{2} + \sin^{-1}(-\cos(0.9276) \cos(-0.5140) \sin(1.8963)$$

$$+ \cos(0.9276) \sin(-0.5140) \cos(1.8963))$$

$$= -0.4121, 1.1587$$

$$\psi =$$

$$\pm \cos^{-1}(-\cos(0.9276) \cos(-0.5140) \sin(0.5089) \cos(1.8963) -$$

$$\cos(0.9276) \sin(-0.5140) \sin(0.5089) \sin(1.8963) + \sin(0.9276) \cos(0.5089))$$

$$= 0.4121, -0.4121$$

It can be seen that $\psi = -0.4121$ radians (-23.6101 deg or 336.3899 deg) is the common solution. Since this corresponds to west, $\theta = 1.8963$ radians (108.6519 deg) corresponds to setting time. Therefore, the other θ (-2.9244 radians or -167.5537 deg) corresponds to the rising time.

Analysis

The θ corresponding to rising time for Alcor is -168.0307 deg, which is less than that of Mizar (-167.5537 deg). Therefore, **Alcor rises first**. Considering that the Earth rotates at about 0.0042 deg/s, Alcor rises $(-167.5537 + 168.0307)/0.0042 = 114.16$ seconds before Mizar.

Similarly, the θ corresponding to setting time for Alcor is 109.1160 deg, which is greater than that of Mizar (108.6519 deg). Therefore, **Mizar sets first**, and Alcor sets $(109.1160 - 108.6519)/0.0042 = 111.08$ seconds later.